OCR
Oxford Cambridge and RSA

…day June 20XX – Morning/Afternoon

AS Level Geography

H081/02 Geographical debates

SAMPLE MARK SCHEME

Duration: 1 hour 30 minutes

MAXIMUM MARK 68

DRAFT

This document consists of 88 pages

MARKING INSTRUCTIONS

PREPARATION FOR MARKING

SCORIS

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *scoris assessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

3. Log-in to scoris and mark the **required number** of practice responses ("scripts") and the **required number** of standardisation responses.

   YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

TRADITIONAL

Before the Standardisation meeting you must mark at least 10 scripts from several centres. For this preliminary marking you should use **pencil** and follow the **mark scheme**. Bring these **marked scripts** to the meeting.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the scoris 50% and 100% (traditional 50% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the scoris messaging system.

5. Work crossed out:
   a. where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks
   b. if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

7. There is a NR (No Response) option. Award NR (No Response)
   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
   - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The scoris **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
   If you have any questions or comments for your Team Leader, use telephone, email or the scoris messaging system.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. **Annotations**

Annotation	Meaning

11. **Subject-specific Marking Instructions**

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper and its rubrics
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

USING THE MARK SCHEME

Please study this Mark Scheme carefully. The Mark Scheme is an integral part of the process that begins with the setting of the question paper and ends with the awarding of grades. Question papers and Mark Schemes are developed in association with each other so that issues of differentiation and positive achievement can be addressed from the very start.

This Mark Scheme is a working document; it is not exhaustive; it does not provide ‘correct’ answers. The Mark Scheme can only provide ‘best guesses’ about how the question will work out, and it is subject to revision after we have looked at a wide range of scripts.

The Examiners’ Standardisation Meeting will ensure that the Mark Scheme covers the range of candidates’ responses to the questions, and that all Examiners understand and apply the Mark Scheme in the same way. The Mark Scheme will be discussed and amended at the meeting, and administrative procedures will be confirmed. Co-ordination scripts will be issued at the meeting to exemplify aspects of candidates’ responses and achievements; the co-ordination scripts then become part of this Mark Scheme.

Before the Standardisation Meeting, you should read and mark in pencil a number of scripts, in order to gain an impression of the range of responses and achievement that may be expected.

In your marking, you will encounter valid responses which are not covered by the Mark Scheme: these responses must be credited. You will encounter answers which fall outside the ‘target range’ of Bands for the paper which you are marking. Please mark these answers according to the marking criteria.

Please read carefully all the scripts in your allocation and make every effort to look positively for achievement throughout the ability range. Always be prepared to use the full range of marks.

LEVELS OF RESPONSE QUESTIONS:

The indicative content indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance.

Using 'best-fit', decide first which set of level descriptors best describes the overall quality of the answer. Once the level is located, adjust the mark concentrating on features of the answer which make it stronger or weaker following the guidelines for refinement.

Highest mark: If clear evidence of all the qualities in the level descriptors is shown, the HIGHEST Mark should be awarded.

Lowest mark: If the answer shows the candidate to be borderline (i.e. they have achieved all the qualities of the levels below and show limited evidence of meeting the criteria of the level in question) the LOWEST mark should be awarded.

Middle mark: This mark should be used for candidates who are secure in the level. They are not 'borderline' but they have only achieved some of the qualities in the level descriptors.

Be prepared to use the full range of marks. Do not reserve (e.g.) highest level marks 'in case' something turns up of a quality you have not yet seen. If an answer gives clear evidence of the qualities described in the level descriptors, reward appropriately.

Quality of extended response will be assessed in questions marked with an (*). Quality of extended response is not attributed to any single assessment objective but instead is assessed against the entire response for the question.

	AO1	AO2	AO3	Quality of extended response
Comprehensive	A wide range of detailed and accurate knowledge that demonstrates fully developed understanding that shows full relevance to the demands of the question. Precision in the use of question terminology.	Knowledge and understanding shown is consistently applied to the context of the question, in order to form a: clear, developed and convincing analysis that is fully accurate. clear, developed and convincing interpretation that is fully accurate. detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based.	Quantitative, qualitative and/or fieldwork skills are used in a consistently appropriate and effective way and with a high degree of competence and precision.	There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.
Thorough	A range of detailed and accurate knowledge that demonstrates well developed understanding that is relevant to the demands of the question. Generally precise in the use of question terminology.	Knowledge and understanding shown is mainly applied to the context of the question, in order to form a : clear and developed analysis that shows accuracy. clear and developed interpretation that shows accuracy. detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence.	Quantitative, qualitative and/or fieldwork skills are used in a suitable way and with a good level of competence and precision.	There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence.

Reasonable	Some sound knowledge that demonstrates partially developed understanding that is relevant to the demands of the question. Awareness of the meaning of the terms in the question.	Knowledge and understanding shown is partially applied to the context of the question, in order to form a: sound analysis that shows some accuracy. sound interpretation that shows some accuracy. sound evaluation that offers generalised judgements and conclusions, with limited use of evidence.	Quantitative, qualitative and/or fieldwork skills are used in a mostly suitable way with a sound level of competence but may lack precision.	The information has some relevance and is presented with limited structure. The information is supported by limited evidence.
Basic	Limited knowledge that is relevant to the topic or question with little or no development. Confusion and inability to deconstruct terminology as used in the question.	Knowledge and understanding shows limited application to the context of the question in order to form a: simple analysis that shows limited accuracy. simple interpretation that shows limited accuracy. Un-supported evaluation that offers simple conclusions.	Quantitative, qualitative and/or fieldwork skills are used inappropriately with limited competence and precision.	The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.

Question			Answer	Marks	Guidance
1	(a)		**Explain how ice cores are used to reconstruct past climate.** Ice core drilling began in 1950s mainly on the Greenland and Antarctic ice sheets, trying to identify bubbles in ice cores (✓). The bubbles in ice cores preserve annual layers of the world's ancient atmosphere and air temperatures (✓). Looking at past concentrations of greenhouse gases in layers in ice cores allows scientists to make comparisons with concentrations of carbon dioxide and methane gases today (✓). The presence of dust and trace chemicals in the ice can be determined, these could be from volcanic activity or increased periods of aridity (✓).	**4** **AO1 x4**	**AO1 – 4 marks** 4 x 1 mark (✓) for each correct explanation Focus should be on how the method is used to reconstruct past climate
	(b)		**Suggest why one EDC's greenhouse gas emissions have changed over time.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the contribution of one EDC to anthropogenic greenhouse gas emissions over time (AO1). The answer should include **accurate place-specific** detail. Amount of place-specific detail determines credit within the level. Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to why one EDCs greenhouse gas emissions have changed over time (AO2). **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the changes in one EDCs greenhouse gas emissions over time (AO1).	**6** **AO1 x3** **AO2 x3**	**Indicative content** Any EDC may be used in the answer and the choice of EDC will determine the content of the answer. **AO1 – 3 marks** Knowledge and understanding of the contribution of one EDC to anthropogenic greenhouse gases could potentially include: • anthropogenic greenhouse gases e.g. carbon dioxide, methane, nitrous oxide, fluorinated gases • main sources of greenhouse gas emissions due to human activity e.g. burning fossil fuels, farming, forestry, cement manufacture and aersols (CFCs) • in 2010 China contributed 23% of global GHG • China's GHG emissions have risen from approximately 4.5 (million metric tons of carbon dioxide equivalent) in 2000, to 7.3 (2005), 9.7 (2010) to 11.4 (2014). **AO2 – 3 marks** Application of knowledge and understanding to

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td></td><td></td><td></td><td>The answer should include some place-specific detail which is partially accurate. Amount of place-specific detail determines credit within the level.

Demonstrates reasonable application of knowledge and understanding to provide a sound analysis that shows some accuracy as to why one EDCs greenhouse gas emissions have changed over time (AO2).

Level 1 (1-2 marks)
Demonstrates basic knowledge and understanding of the changes in one EDCs greenhouse gas emissions over time (AO1).

There is an attempt to include place-specific detail but it is inaccurate.

Demonstrates basic application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to why one EDCs greenhouse gas emissions have changed over time (AO2).

0 marks
No response or no response worthy of credit.</td><td></td><td>analyse why one EDC’s greenhouse gas emissions have changed over time could potentially include:
• carbon emissions from fossil fuels have significantly increased since the 2000s particularly due to coal. 50% of China’s coal consumption (2014) is used to generate electricity
• China’s rise to the second largest economy was largely driven by its coal consumption. It is averaging four billion tonnes a year
• rapid rate of industrialisation particularly in the production of steel, meant coal was an essential raw material
• population increase in China has led to the growth of cities e.g. Shanghai, Beijing, Nanjing and car ownership
• deforestation and impact on CO_2 levels
• the future – China’s greenhouse gas emissions are set to fall by 2025, with an increased drive towards renewables. Climate Action Tracker has recorded China’s target to reach peak CO_2 emissions by 2030 at the latest.</td></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>Using the carbon dioxide emissions data above, calculate the interquartile range. You must show your working.

Rank order
<table><tr><td>1</td><td>89</td></tr><tr><td>2</td><td>448</td></tr><tr><td>3</td><td>462</td></tr><tr><td>4</td><td>482</td></tr><tr><td>5</td><td>611</td></tr><tr><td>6</td><td>759</td></tr><tr><td>7</td><td>1246</td></tr></table></td><td>4
AO3 x4</td><td>AO3 – 4 marks
1 mark (✓) rank order of data
1 mark (✓) Upper quartile value identified
1 mark (✓) Lower quartile value identified
1 mark (✓) Interquartile range / answer

(Students do not need to use the formula necessarily – the 6th value is the mid point and the 3rd and 9th values can be identified as the LQ and UQ.)</td></tr>
</table>

Question			Answer	Marks	Guidance
			8 1812 9 2407 10 5233 11 9977 UQ – 2407 LQ – 462 Workings 2407 - 462 Interquartile range = 1945		**Formulae** Lower quartile (LQ) = $\frac{n+1}{4}$ Upper quartile (UQ) = $\frac{n+1}{4} \times 3$ IQR = UQ – LQ n = number of items in the data set.
		(ii)	**Using evidence from the table, analyse the contrasts in carbon dioxide emissions from fossil fuels.** **Level 3 (5-6 marks)** Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy as to the contrasts in carbon dioxide emissions from fossil fuels (AO2). Demonstrates **thorough** investigation and interpretation of the quantitative data resource to fully evidence the contrasts in carbon dioxide emissions. There must be good ideas linking resource evidence to the possible causes of the contrasts in carbon dioxide emissions (AO3). **Level 2 (3-4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to the contrasts in carbon dioxide emissions from fossil fuels (AO2). Demonstrates **reasonable** interpretation of the quantitative data resource to evidence the contrasts in carbon dioxide emissions. There must be sound ideas linking resource evidence to the possible causes of the contrasts in carbon	**6** **AO2 x3** **AO3 x3**	**Indicative Content** **AO2 – 3 marks** Application of knowledge and understanding to analyse the contrasts in CO_2 emissions could potentially include: • scale of industrial development and government policies on emission levels • relative population size and need for electricity production • types of energy production, balance of non-renewable versus renewable energies • energy efficiency and conservation strategies • role of international directives and emission levels. **AO3 – 3 marks** Evidence from interpretation of the resource could potentially include: • the four ACs emission data varies significantly from 462 (UK) – 5233 (USA) MtCo2 • difference of 4,771 MtCO2 between the UK and USA carbon dioxide emission levels • three of the seven EDCs have carbon dioxide emissions greater than 1500 MtCO2, with China the highest

Question			Answer	Marks	Guidance
			dioxide emissions (AO3). **Level 1 (1-2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to the contrasts in carbon dioxide emissions from fossil fuels (AO2). Demonstrates **basic** interpretation of the quantitative data resource providing limited evidence of contrasts in carbon dioxide emissions. There will be limited ideas about contrasts to carbon dioxide emissions with limited or no link to resource evidence (AO3). **0 marks** No response or no response worthy of credit.		• China has higher CO_2 emissions than nine of the other countries combined • Brazil has the lowest CO_2 emissions of the EDCS.
	(d)		**'Oceans are the best indicator of a warming world'. How far do you agree with this statement?** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of evidence the world has warmed (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether oceans are the best climate indicator (AO2). This will be shown by including **well-developed** ideas about whether oceans are the best climate indicator **Level 3 (7-9 marks)** Demonstrates **thorough** knowledge and understanding of evidence the world has warmed (AO1). Demonstrates **thorough** application of knowledge and	**12** **AO1 x6** **AO2 x6**	**Indicative Content** **AO1 – 6 marks** Knowledge and understanding of evidence the world has warmed could potentially include: • oceans play a key role in absorbing heat, as greenhouse gases trap more energy from the sun, the oceans are absorbing more heat resulting in an increase in sea surface temperature • IPCC suggests most convincing evidence of ocean heating can be found in the Arctic, North Atlantic, Eastern Pacific and Indian Oceans • sea surface temperatures increased globally over the 20th century. These temperatures have been higher in the last three decades since the late 1880s • IPCC > 0.1°C per decade in the upper 75m ocean and 0.015°C per decade at 700m depth • Antarctic water, the coldest, deep water ocean is showing signs of warming • other evidence the world has warmed such as

Question			Answer	Marks	Guidance
			understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether oceans are the best climate indicator (AO2). This will be shown by including **well-developed** ideas about whether expanding oceans are the best climate indicator. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of evidence the world has warmed (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether oceans are the best climate indicator (AO2). This will be shown by including **developed** ideas about whether expanding oceans are the best climate indicator. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of evidence the world has warmed (AO1). Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether oceans are the best climate indicator (AO2). This will be shown by including **simple** ideas about whether expanding oceans are the best climate indicator. **0 marks** No response or no response worthy of credit.		increases in surface or atmospheric temperatures, shrinking of valley glaciers and ice sheets, rising sea level, increasing atmospheric water vapour, decreasing snow cover and sea ice. **AO2 – 6 marks** Application of knowledge and understanding to evaluate whether oceans are the best climate indicator of a warming world could potentially include: • lack of long term data for heat / thermal expansion of oceans compared to ice core data to show atmospheric temperature changes • evidence of ocean cooling in some sub-polar gyres such as North Pacific and North Atlantic • climate indictors often interrelated such as ocean temperatures, thermal expansion and sea level rise or melting of ice and ocean temperatures • change in ocean systems occur over much longer periods than the atmosphere. Interactions between the oceans and atmosphere occur slowly over months and years as does the movement of water within oceans. Therefore it takes many more years to adapt to and reflect climate change • tracking ocean heat contributes to an understanding of long term climate trends as the heat energy stored deep in the ocean is gradually released into the atmosphere • focus on a range of indicators gives a more comprehensive understanding of climate change.

Question			Answer	Marks	Guidance
2	(a)		**Explain disease diffusion using the Hägerstrand model.** Diffusion means a disease is transmitted to a new location (relocation diffusion) (✓). A disease spreads from a source location to a new area (✓). The spread of disease could be contagious from one directly infected person to another non-infected person (✓). The spread of disease can be affected by barriers such as distance (a natural barrier) (✓).	**4** **AO1 x4**	**AO1 – 4 marks** 1 mark (✓) for each correct explanation Focus should be on the Hägerstrand model to explain disease diffusion
	(b)		**Suggest why one country experiencing air pollution has seen incidences of cancer change over time.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of how one country experiencing air pollution has seen incidences of cancer change over time (AO1). The answer should include **accurate place-specific** detail. Amount of place-specific detail determines credit within the level. Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to why one country experiencing air pollution has seen incidences of cancer change over time (AO2). **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of how one country experiencing air pollution has seen incidences of cancer change over time (AO1). The answer should include some **place-specific** detail which is **partially accurate**. Amount of place-specific detail determines credit within the level.	**6** **AO1 x3** **AO2 x3**	**Indicative content** Any country may be used in the answer and the choice of country will determine the content of the answer. **AO1 – 3 marks** Knowledge and understanding of how one country experiencing air pollution has seen incidences of cancer change over time could potentially include: • evidence that outdoor air pollution, e.g. particulate matter which is carcinogenic to humans, as well as exhaust and industrial fumes, has been linked to lung cancer through changes in DNA e.g. International Agency for Research on Cancer (2013) • 40,000 people approximately die prematurely in the UK each year due to air pollution • nature of air pollution has changed over time and related disease / cancer risk e.g. 1940s/50s sulphur dioxide from soot, 1960s/80s carbon monoxide from lead, 1980/2000s nitrogen dioxide from particulates and by 2014, 50% of our new cars were diesel • particulate matter (also known as particle pollution) of 2.5 micrometers (in diameter) and nitrogen dioxide have similar harmful effects and are linked to lung cancer • incidences of lung cancer in the UK have

Question			Answer	Marks	Guidance
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to why one country experiencing air pollution has seen incidences of cancer change over time (AO2). **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of the how one country experiencing air pollution has seen incidences of cancer change over time (AO1). There is an attempt to include **place-specific** detail but it is **inaccurate**. Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to why one country experiencing air pollution has seen incidences of cancer change over time (AO2). **0 marks** No response or no response worthy of credit.		decreased for men by approximately 57% but increased for women by 63% between 1972 and 2013, this however includes smoking habits particularly in the 1970s -1980s. In 2013, 45,000 people were diagnosed with lung cancer **AO2 – 3 marks** Application of knowledge and understanding to analyse why one country experiencing air pollution has seen incidences of cancer change over time could potentially include: • longer term exposure to air pollution decreases lung function • increase in concentration of particulate matter to 10 micrometers per m^3 led to a corresponding increase in lung cancer risk • technology advances to record, model and predict air pollutants and an improved understanding of the link with lung cancer • higher concentration of cars on the roads with increased congestion and stationary traffic contributing atmospheric pollutants • changes in government policy such as an increased use of renewable energy, electric cars and emission rates from factories are monitored or filters added • UK government committee on the medical effects of air pollutants is closely monitoring levels and the effects on cancer (COMEAP).

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<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>

Using the tuberculosis incidence data above, calculate the interquartile range. You must show your working.

Rank order

<table>
<tr><td>1</td><td>42</td></tr>
<tr><td>2</td><td>61</td></tr>
<tr><td>3</td><td>90</td></tr>
<tr><td>4</td><td>110</td></tr>
<tr><td>5</td><td>120</td></tr>
<tr><td>6</td><td>130</td></tr>
<tr><td>7</td><td>170</td></tr>
<tr><td>8</td><td>360</td></tr>
<tr><td>9</td><td>450</td></tr>
<tr><td>10</td><td>930</td></tr>
<tr><td>11</td><td>2200</td></tr>
</table>

UQ – 450 LQ – 90
Workings 450 - 90
Interquartile range = 360

</td><td>

4
AO3 x4

</td><td>

AO3 – 4 marks
1 mark (✓) rank order of data
1 mark (✓) Upper quartile value identified
1 mark (✓) Lower quartile value identified
1 mark (✓) Interquartile range / answer

(Students do not need to use the formula, the 6th value is the mid point and the 3rd and 9th values can be identified as the LQ and UQ.)

Formulae
Lower quartile (LQ) $= \frac{n+1}{4}$
Upper quartile (UQ) $= \frac{n+1}{4} \times 3$
IQR = UQ − LQ
n = number of items in the data set.

</td></tr>
<tr><td></td><td>(c)</td><td>(ii)</td><td>

Using evidence from the table, analyse the contrasts in tuberculosis incidence.

Level 3 (5-6 marks)
Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to the contrasts in tuberculosis incidence (AO2).

Demonstrates **thorough** interpretation of the quantitative data resource to fully evidence the contrasts in tuberculosis incidence. There must be good ideas linking resource evidence to the possible causes of the contrasts in tuberculosis incidence (AO3).

</td><td>

6
AO2 x3
AO3 x3

</td><td>

Indicative Content
AO2 – 3 marks
Application of knowledge and understanding to analyse the contrasts in tuberculosis incidence could potentially include:

- tuberculosis (TB) is an infectious disease and will spread rapidly in populations of high density
- there is potentially greater accessibility to vaccinations in more developed countries
- levels will be lower where there is more education and awareness
- in developed countries more money is invested in treatment and diagnosis
- increasing mobility of populations both nationally and internationally can increase the

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Question			Answer	Marks	Guidance
			Level 2 (3-4 marks) Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to the contrasts in tuberculosis incidence (AO2). Demonstrates **reasonable** interpretation of the quantitative data resource to evidence the contrasts in tuberculosis incidence. There must be sound ideas linking resource evidence to the possible causes of the contrasts in tuberculosis incidence (AO3). **Level 1 (1-2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to the contrasts in tuberculosis incidence (AO2). Demonstrates **basic** interpretation of the quantitative data resource providing limited evidence of contrasts in tuberculosis incidence. There will be limited ideas about contrasts in tuberculosis incidence with limited or no link to resource evidence (AO3). **0 marks** No response or no response worthy of credit.		incidence risk • poorly managed public health and / or TB programs can increase the risk of the disease occurring and its subsequent spread • there is some evidence of co-existence of TB in HIV areas in African nations. **AO3 – 3 marks** Evidence from interpretation of the resource could potentially include: • countries with high population and high population density have high levels of incidence e.g. India (2,200,000 incidences), China (930,000) and Bangladesh (360,000) • there is a difference of 2,158,000 between the highest incidence in India (EDC) and the lowest in Zimbabwe (EDC) • incidence given as total numbers not proportion of the population, so the more highly populated countries e.g. India and China have the higher incidences • LIDCs range in incidences by 299,000 from Bangladesh to Uganda • the top two countries for tuberculosis, China has less than half the number of incidences than India.

Question			Answer	Marks	Guidance
	(d)		**'Affluence is one of the main causes of noncommunicable disease'. How far do you agree with this statement?** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of affluence as a cause of noncommunicable disease (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether affluence is one of the main causes of noncommunicable disease (AO2). This will be shown by including **well-developed** ideas about whether affluence is one of the main causes of noncommunicable disease. **Level 3 (7-9 marks)** Demonstrates **thorough** knowledge and understanding of affluence as a cause of noncommunicable disease (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether affluence is one of the main causes of noncommunicable disease (AO2). This will be shown by including **well-developed** ideas about whether affluence is one of the main causes of noncommunicable disease. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of affluence as cause of noncommunicable disease. (AO1). Demonstrates **reasonable** application of knowledge and	**12** **AO1 x6** **AO2 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of affluence as a cause of noncommunicable disease could potentially include: • noncommunicable disease could be caused by nutrition deficiencies (e.g. rickets), lifestyle (e.g. heart disease) and genetic (e.g. stroke) • rising standards of living impact upon susceptibility to disease and influence the countries epidemiological transition • reasons why ACs have a higher prevalence for noncommunicable diseases (diseases of affluence) e.g. modern diet, alcohol consumption and more sedentary lifestyles • social causes of noncommunicable disease e.g. tobacco exposure, harmful use of alcohol, social isolation, stress, anxiety and depression • economic causes of noncommunicable disease e.g. cheaper high fat and sugary foods (diet high in saturated fat is a risk for strokes and cardio-vascular disease) • cultural causes of noncommunicable disease e.g. physical inactivity, high cholesterol, obesity, ethnic origin and gender • environmental factors e.g. air pollution and links to incidences of cancer. **AO2 – 6 marks** Application of knowledge and understanding to evaluate whether affluence is one of the main causes of noncommunicable disease could potentially include: • more sedentary lifestyle due to changing work habits, increased use of technology, longer working day (commuting), cost of gym memberships / leisure facilities, home entertainment systems, means people's BMI is gradually increasing therefore their disease risk

Question			Answer	Marks	Guidance
			understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether affluence is one of the main causes of noncommunicable disease (AO2). This will be shown by including **developed** ideas about whether affluence is one of the main causes of noncommunicable disease. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of affluence as a cause of noncommunicable disease. (AO1). Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether affluence is one of the main causes of noncommunicable disease when compared to others (AO2). This will be shown by including **simple** ideas about whether affluence is one of the main causes of noncommunicable disease. **0 marks** No response or no response worthy of credit.		increases • longer life expectancy so increased risk of developing chronic or degenerative diseases such as cancers, diabetes, cardio-vascular problems • affluence interrelated to a number of factors affecting noncommunicable diseases. People's life-styles choices particularly through food, alcohol consumption and lower levels of exercise can impact on susceptibility to disease e.g. strokes and heart disease • genetic disposition to particular diseases e.g. breast cancers • environmental factors such as air pollution cause cardiovascular problems and lung cancers. Hot spots of environmental pollutants such as urban or industrial areas as well as prolonged exposure e.g. car exhaust fumes. Climate change could exacerbate pollutants and therefore disease risk • high alcohol or sugar consumption in some cultures increase risk of disease such as diabetes. Whilst this could be linked to low income areas / communities, obesity can also be a disease of affluence • affluence could be a 'cure' not a cause of noncommunicable disease with research (e.g. cancers), pharmaceutical trials and surgical procedures (e.g. heart transplant) constantly being advanced.

Question			Answer	Marks	Guidance
3	(a)		**Explain the vertical variations in ocean water salinity.** The salinity of surface water in the ocean can be diluted by rain, river inflow or ice melting (✓). Salinity in desert areas such as the Red Sea is higher than equatorial areas due to evaporation (✓). Higher salinity is created where outflow water from the Mediterranean travels into the North Atlantic, it is more dense and sinks to an intermediate depth (✓). North Atlantic Deep Water is formed where water reaching the ocean cools and sinks through convection due to its increased density, lower temperatures and increased salinity (✓).	**4** **AO1 x4**	**AO1 – 4 marks** 1 mark (✓) for each correct explanation Focus should be on the vertical variations in ocean salinity
	(b)		**Suggest why the management of one oil spill can be environmentally challenging.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of how one oil spill can be can be managed (AO1). The answer should include **accurate place-specific** detail. Amount of place-specific detail determines credit within the level. Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to why the management of one oil spill can be environmentally challenging (AO2). **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of how one oil spill can be can be managed (AO1). The answer should include some **place-specific** detail which is **partially accurate**. Amount of place-specific detail determines credit within the level.	**6** **AO1 x3** **AO2 x3**	**Indicative content** Any oil spill may be used in the answer and the choice of oil spill will determine the content of the answer. **AO1 – 3 marks** Knowledge and understanding of how one oil spill can be can be managed could potentially include: • Deep water Horizon (BP) oil spill in 2010 was the largest marine spill in US waters with 50-60,000 barrels leaking per day spilling into the Gulf of Mexico • management of the oil spill e.g. booms to contain the spread, burning oil on the ocean surface, chemical dispersants e.g. corexit, cleaning agents for birds / mammals, water jets and manual clean-up for beach areas (Florida, Alabama, Mississippi). **AO2 – 3 marks** Application of knowledge and understanding to analyse why the management of one oil spill can be environmentally challenging could potentially include: • the scale and volume of the oil spill in terms of geographical area covered created significant environmental challenges for management of

Question			Answer	Marks	Guidance
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to why the management of one oil spill can be environmentally challenging (AO2). **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of how one oil spill can be can be managed (AO1). There is an attempt to include **place-specific** detail but it is **inaccurate**. Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to why the management of one oil spill can be environmentally challenging (AO2). **0 marks** No response or no response worthy of credit.		the oil spill. The continued flow of oil for 11 weeks at approx. 50,000 barrels a day e.g. by early June 125 miles of Louisiana's coast had seen oil washed up • the severity and range of environmental impacts on marine ecosystems e.g. chemicals leached into the marine environment were absorbed travelled through the food chain. Tuna and amberjacks saw significant increases in their cardio toxicity • extensive damage to wildlife habitats e.g. sea birds, wetlands and beach areas (Florida) • storm conditions (particularly high winds) created environmental challenges as attempts to contain the oil spill using containment booms (21,000ft) failed to stop the spread of the slick • controlled burns as the oil floated (as it is hydrophobic) on the ocean surface and chemical dispersants had environmental impacts of their own e.g. carbon dioxide emissions or cancer causing toxins • long term environmental monitoring and management is difficult e.g. fishermen reported deformed fish 2 – 3 years after the spill, as well as significantly decreased fish stocks e.g. blue fin tuna, scientists not sure if this is from the chemical dispersants or the oil leak itself

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>

Using the weight of plastic data above, calculate the interquartile range. You must show your working.

Rank order

1	44
2	242
3	368
4	1 344
5	2 311
6	8 018
7	8 142
8	65 315
9	70 036
10	199 557
11	233 648

UQ – 70 036 LQ – 368
Workings 70 036 - 368
Interquartile range = 69 668

</td><td>**4**
AO3 x4</td><td>

AO3 – 4 marks
1 mark (✓) rank order of data
1 mark (✓) Upper quartile value identified
1 mark (✓) Lower quartile value identified
1 mark (✓) Interquartile range / answer

(students do not necessarily need to use the formula, 6th value is the mid point and the 3rd and 9th values can be identified as the LQ and UQ)

Formulae
Lower quartile (LQ) $= \frac{n+1}{4}$
Upper quartile (UQ) $= \frac{n+1}{4} \times 3$
IQR = UQ − LQ
n = number of items in the data set.

</td></tr>
<tr><td></td><td>(c)</td><td>(ii)</td><td>

Using evidence from the table, analyse the contrasts in weight of plastic collected.

Level 3 (5-6 marks)
Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to the contrasts in weight of plastic collected (AO2).

Demonstrates **thorough** interpretation of the quantitative data resource to fully evidence the contrasts in weight of plastic collected. There must be good ideas linking resource evidence to the possible causes of the contrasts in weight of plastics collected (AO3).

Level 2 (3-4 marks)
Demonstrates **reasonable** application of knowledge and

</td><td>**6**
AO2 x3
AO3 x3</td><td>

Indicative Content
AO2 – 3 marks
Application of knowledge and understanding to analyse the contrasts in weight of plastics collected could potentially include:
- ocean currents distribute waste and so it is difficult to fully attribute the source of the plastic pollution
- low density plastic transported long distances
- a country's level of industrialisation, higher levels lead to more waste plastic
- ocean currents create zones of convergence where large amounts of plastic waste accumulate
- countries with a higher level of economic development and a more consumer based society will have more plastic waste

</td></tr>
</table>

Question			Answer	Marks	Guidance
			understanding to provide a sound analysis that shows some accuracy as to the contrasts in weight of plastic collected (AO2). Demonstrates **reasonable** interpretation of the quantitative data resource to evidence the contrasts in weight of plastics collected. There must be sound ideas linking resource evidence to the possible causes of the contrasts in weight of plastics collected (AO3). **Level 1 (1-2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to the contrasts in weight of plastics collected (AO2). Demonstrates **basic** interpretation of the quantitative data resource providing limited evidence of contrasts in weight of plastics collected. There will be limited ideas about contrasts in weight of plastics collected (AO3). **0 marks** No response or no response worthy of credit.		• plastic is less expensive to manufacture, it is widely available and overused across the development spectrum • plastic accumulated from commercial fishing nets **AO3 – 3 marks** Evidence from interpretation of the resource could potentially include: • high levels in ACs such as Canada e.g. 199, 557 lbs and industrialised EDCs such as India e.g. 233,648 lbs • wide contrast between the highest and lowest, difference of 233,604lb • ACs not always the highest scores e.g. Australia 242lbs. Difference of approximately 199,300lbs between the highest and lowest weight of plastic in ACs • countries surrounded by sea not always highest e.g. Japan (4th) and Australia (10th) • North Atlantic and North Pacific are highly polluted with plastics, this can account for high levels in Canada.
	(d)		**'Oceans present hazardous obstacles to human activities'. How far do you agree with this statement?** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of hazardous obstacles and human activities in oceans (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether oceans present hazardous obstacles to human activity (AO2).	**12** **AO1 x6** **AO2 x6**	**Indicative Content** **AO1 – 6 marks** Knowledge and understanding of hazardous obstacles and human activity in oceans could potentially include: • the distribution of 21st century piracy • the use of oceans as escape routes for migrants e.g. North Africa to Europe • the direction and type of trade across the oceans • a marine conflict zone where countries dispute ocean territory areas e.g. South China Sea • human activities in oceans e.g. use of biological

Question			Answer	Marks	Guidance
			This will be shown by including **well-developed** ideas about whether oceans present hazardous obstacles to human activity. **Level 3 (7-9 marks)** Demonstrates **thorough** knowledge and understanding of hazardous obstacles and human activities in oceans (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether oceans present hazardous obstacles (AO2). This will be shown by including **well-developed** ideas about whether oceans present hazardous obstacles to human activity. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of hazardous obstacles and human activities in oceans (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether oceans present obstacles to human activity (AO2). This will be shown by including **developed** ideas about whether oceans present obstacles to human activity. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of hazardous obstacles and human activities in oceans (AO1). Demonstrates **basic** application of knowledge and		and energy resources, extraction of sea bed minerals • oceans present hazardous obstacles which are physical / natural e.g. relief of ocean basins, currents, ecosystem predators, warming temperatures. **AO2 –6 marks** Application of knowledge and understanding to evaluate whether oceans present hazardous obstacles to human activity could potentially include: • the value of oceans for energy resources – however, ocean basin relief and currents can provide challenges for oil and gas production due to drilling a wellbore in the seabed in deepwater areas. One of the world's deepest hubs is currently the Perdido in the Gulf of Mexico, floating in 2,438 meters of water • deep sea mining for minerals takes place on the ocean floor approximately 1,400 up to 3,700 below the surface e.g. Papua New Guinea and New Zealand. The hydrothermal vents create sulfide deposits, which contain valuable metals e.g. silver, gold, copper, manganese, cobalt, and zinc. The obstacles presented by the ocean are the accessibility of the mineral deposits due to their deep sea / sea bed locations • territorial waters such as the South China Sea can be sources of conflict as they are shipping routes and have great value to a number of countries. The South China Sea has two chains of islands with mineral resources and the area has high fish stocks. Disputes between China, Vietnam and the Philippines in particular relate to the geographical position of the islands, trade routes and access to resources

Question			Answer	Marks	Guidance
			understanding to provide an un-supported evaluation that offers simple conclusions as to whether oceans present obstacles to human activity (AO2). This will be shown by including **simple** ideas about the obstacles oceans present and different human activities. **0 marks** No response or no response worthy of credit.		• a number of human activities create hazardous obstacles within the oceans such as mineral and energy resource extraction as pollutants impact marine ecosystems. The ocean can be used as a 'dumping ground' for waste products e.g. plastics and nuclear waste this affects ocean temperatures and the marine ecosystems • oceans can provide escape routes e.g. Mediterranean sea. Whilst this stretch of sea from North Africa to Europe could be seen to be less hazardous e.g. currents, lighter winds, warmer temperatures the obstacles are very real for migrants such as exposure, boats are densely packed with people in poor conditions, with boats capsizing and many unable to swim • piracy off the coast of Somalia has been a threat to international shipping with economic impacts as shipping expenses are increased. It's thought the causes of piracy from the early 2000s were in response to illegal fishing by foreign boats and the dumping of toxic waste by foreign boats, both of which affected local fishermen from using the coastal waters and being able to earn a living so they formed armed groups.

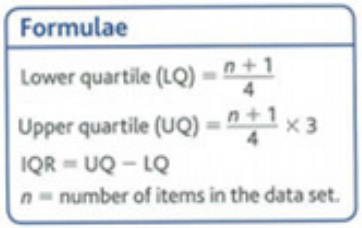
Question			Answer	Marks	Guidance
4	(a)		**Explain the physical conditions required for growing food.** Variable temperatures, light intensity and duration are required for crops, any reduction in these can affect yields (✓). Water is essential for germination and plant growth and for certain biological functions (✓). Photosynthesis involves the absorption of CO_2 from the air and plants require O_2 for respiration (✓). Soils contain the mixture of mineral and organic matter for plant growth e.g. nitrogen (✓).	**4** **AO1 x4**	**AO1 – 4 marks** 1 mark (✓) for each correct explanation Focus should be on the physical conditions for growing food.
	(b)		**Suggest why one indigenous group's food security can change over time.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the threats to indigenous group's food security (AO1). The answer should include **accurate place-specific** detail. Amount of place-specific detail determines credit within the level. Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to why one indigenous group's food security can change over time (AO2). **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the threats to indigenous group's food security (AO1). The answer should include some **place-specific** detail which is **partially accurate**. Amount of place-specific detail determines credit within the level. Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some	**6** **AO1 x3** **AO2 x3**	**Indicative content** Any indigenous group may be used in the answer and the choice of indigenous group will determine the content of the answer. **AO1 – 3 marks** Knowledge and understanding of the threats to indigenous group's food security could potentially include: • Nunavut indigenous Inuit people from the Canadian Arctic survive largely by harvesting plants and animals at a subsistence level, their food insecurity is 5 times the national average • climate change is threatening the Nunavut's subsistence farming culture e.g. animal migration patterns or plants not adapting as quickly as the climate is warming • the accessibility of food supplies and availability of healthy food especially for impoverished communities e.g. nearly 70% of households find it hard to access affordable / nutritious food • reliance on food supplies from outside the area this is particularly important for remote communities

Question			Answer	Marks	Guidance
			accuracy as to why one indigenous group's food security can change over time (AO2). **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of the threats to indigenous group's food security (AO1). There is an attempt to include **place-specific** detail but it is **inaccurate**. Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to why one indigenous group's food security can change over time (AO2). **0 marks** No response or no response worthy of credit.		**AO2 – 3 marks** Application of knowledge and understanding to analyse why one indigenous group's food security can change over time could potentially include: • climate change / changing environmental conditions e.g. warmer weather, thinner ice, variable snowfall (e.g. difficult for animals foraging), unpredictable weather (e.g. prevents food arriving by air) • wildlife stocks declining so fewer numbers for hunting (e.g. Muskoxen), health of wildlife, changing migration routes due to climate change (e.g. more challenging to hunt as they are further from community groups) • rising costs e.g. farming equipment makes it challenging to grow and produce food • changing diets and food practices through the potential modernisation of communities, with considerable numbers of people with low incomes e.g. hunting has become more a weekend activity and people prefer to eat local food • need for more food processing facilities close to the Nunavut, currently there are only 3 e.g. Kitikmoet Foods in Cambridge Bay • loss of traditional knowledge to hunt and harvest wildlife as it becomes more challenging to gain food from the environment • population growth is putting pressure on resources and their potential sustainability • international pressure to preserve the Arctic environment can be opposed to traditional hunting rights and practices • hunting as a tourist activity depletes wildlife stocks e.g. Muskoxen, Caribou or small game

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td colspan="3"></td><td></td><td></td><td>such as Arctic hares.</td></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>Using the Global Food Security Index data above, calculate the interquartile range. You must show your working.

Rank order
<table><tr><td>1</td><td>27.9</td></tr><tr><td>2</td><td>41.2</td></tr><tr><td>3</td><td>46.1</td></tr><tr><td>4</td><td>49.4</td></tr><tr><td>5</td><td>58.6</td></tr><tr><td>6</td><td>63.1</td></tr><tr><td>7</td><td>64.2</td></tr><tr><td>8</td><td>67.4</td></tr><tr><td>9</td><td>81.6</td></tr><tr><td>10</td><td>84.2</td></tr><tr><td>11</td><td>88.2</td></tr></table>
UQ – 81.6 LQ – 46.1
Workings 81.6-46.1=35.5
Interquartile range = 35.5</td><td>4
AO3 x4</td><td>AO3 – 4 marks
1 mark (✓) rank order of data
1 mark (✓) Upper quartile value identified
1 mark (✓) Lower quartile value identified
1 mark (✓) Interquartile range / answer

(students do not necessarily need to use the formula, the 6th value is the mid point and the 3rd and 9th values can be identified as the LQ and UQ.)

 
</td></tr>
<tr><td></td><td>(c)</td><td>(ii)</td><td>Using evidence from the table, analyse the contrasts in the Global Food Security Index (GFSI) scores.

Level 3 (5-6 marks)
Demonstrates thorough application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to the contrasts in the Global Security Index (AO2).

Demonstrates thorough interpretation of the quantitative data resource to fully evidence the contrasts in the Global Security Index. There must be good ideas linking resource evidence to the possible causes of the contrasts in the Global Security Index (AO3).</td><td>6
AO2 x3
AO3 x3</td><td>Indicative content
AO2 – 3 marks
Application of knowledge and understanding to analyse the contrasts in the Global Food Security Index (GFSI) scores could potentially include:
• country’s political stability, financial and technological capability to grow food
• ability of a country to import food to ensure availability
• in EDCs and LIDCs food safety is not always assured due to a lack of regulations and monitoring
• some LIDCs are also faced with harsh physical environments e.g. weather extremes, poor quality soil and lack of water supply.</td></tr>
</table>

Question			Answer	Marks	Guidance
			Level 2 (3-4 marks) Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to the contrasts in the Global Security Index (AO2). Demonstrates **reasonable** interpretation of the quantitative data resource to evidence the contras in the Global Security Index. There must be sound ideas linking resource evidence to the possible causes of the contrasts in the Global Security Index (AO3). **Level 1 (1-2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to the contrasts in the Global Security Index (AO2). Demonstrates **basic** interpretation of the quantitative data resource providing limited evidence of contrasts in the Global Security Index. There will be limited ideas about contrasts in the Global Security Index with limited or no link to resource evidence (AO3). **0 marks** No response or no response worthy of credit.		Governments may not have the financial means to ensure food availability • in some countries there is a wide gap between income and food prices, which can impact food affordability for individuals, communities and country wide • dependant upon how GFSI is measured as individuals in LIDCs could be self-sufficient on a subsistence level (e.g. gardens, small holdings, allotments) so they are essentially food secure however the data for the country e.g. Chad is at a country level. **AO3 – 3 marks** Evidence from interpretation of the resource could potentially include: • highest GFSI scores in the 3 ACs e.g. Singapore (88.2), Canada (84.2), UK (81.6), with a difference in score of only 6.6 • lowest GFSI scores in the 3 LIDCs e.g. Chad (27.9), Kenya (41.2) and Ghana (46.1), showing the 3 ACs have scores almost double the LIDCs • EDC scores range from Philippines lowest EDC (49.4) to Brazil highest EDC (67.4). Although Brazil is still 14.2 lower in score than the lowest AC • Botswana's GFSI is more than double Chad's GFSI despite the fact they are both LIDCs.

Question			Answer	Marks	Guidance
	(d)		**'Physical factors create the greatest risk to food security'. How far do you agree with this statement?** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of the factors affecting food security (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether physical factors present the greatest risk to food security (AO2). This will be shown by including **well-developed** ideas about whether physical factors present the greatest risk to food security. **Level 3 (7-9 marks)** Demonstrates **thorough** knowledge and understanding of the factors affecting food security (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether physical factors create the greatest risk to food security (AO2). This will be shown by including **well-developed** ideas about whether physical factors are the greatest risk to food security. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of the factors affecting food security (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers	**12** **AO1 x6** **AO2 x6**	**Indicative Content** **AO1 – 6 marks** Knowledge and understanding of factors affecting food security could potentially include: • defining what it means to be food secure and understanding the concept of food security e.g. food access, food availability and food use • the range of physical factors that affect food security e.g. geology, soil, length of growing season • social, economic and political factors affecting food security e.g. land ownership systems, competition and land grabbing • human and physical factors combining to cause issues with food security e.g. Zimbabwe • regions, countries and people whose food security is most at risk across the development spectrum • physical and human causes of desertification and its influence on food security e.g. Dryland areas. **AO2 – 6 marks** Application of knowledge and understanding to evaluate whether physical factors present the greatest risk to food security could potentially include: • physical factors are crucial to food production such as climate, soils, terrain, water supplies and therefore food security. Indigenous and remote communities utilise the environment fully and few other factors are as crucial • physical factors combine with human factors in Zimbabwe to create low levels of food security. Government policies to redistribute land, lack of investment in machinery, fertilisers as well

Question			Answer	Marks	Guidance
			generalised judgements and conclusions, with limited use of evidence as to whether physical factors are the greatest risk to food security (AO2). This will be shown by including **developed** ideas about whether physical factors present the greatest risk to food security. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of the factors affecting food security (AO1). Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether physical factors present the greatest risk to food security (AO2). This will be shown by including **simple** ideas about the factors affecting food security. **0 marks** No response or no response worthy of credit.		as irrigation occurred alongside a physical environment with variable soil quality and rainfall. Zimbabwe's growing population also put pressure on food availability. • even if physical conditions are favourable to food production, political decisions and government policy will impact food security e.g. Singapore. This has favourable conditions to grow food however the small geographical size of the island means there are severe pressures on space. They could quickly have issues with food security if they were unable to import all their food items. Physical factors are not as important to Singapore's food security. • more advanced countries have the political and economic means to ensure food security even if physical conditions pose a threat, they can purchase land (issue of land grabbing) and/or import food • in LIDCs with harsh physical environments (e.g. drought and flooding) there is often a lack of investment, political and technological knowledge needed to overcome these difficulties e.g. famine in Ethiopia • access to food relates to not just supply but also income, markets and prices. Even if the physical environment allows sufficient food production people must still have the economic means to access it • for Malthus, when population outstrips food supplies, a ceiling is reached and a rebalancing leads to diminishing food supplies and population. In fragile physical environments such as the Sahel it takes very little population increase to place pressure on food security.

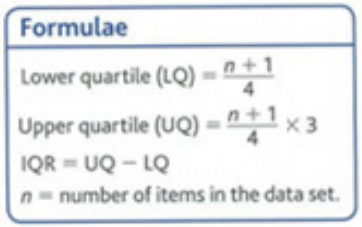
Question			Answer	Marks	Guidance
5	(a)		**Explain how fossil records can be used as evidence of continental drift and plate tectonics theory.** Fossils are the preserved traces of animals and plants found inside rock, they help date geological material (✓). The geographic distribution of fossils has helped to understand the spread of different species over time (✓). Anomalies in the distribution presented a problem for geologists as very similar fossils were discovered in rock masses separated by vast distances or oceans e.g. some of the same fossils were found in southern Africa and the tip of south America (✓). Similar fossilised remains of plants and animals found on different continents provided evidence for Wegener of continental drift (✓).	**4** **AO1 x4**	**AO1 – 4 marks** 1 mark (✓) for each correct explanation Focus should be on how fossils present evidence for continental drift and plate tectonics.
	(b)		**Suggest why people experience varying impacts resulting from one volcanic eruption.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the impacts people experience as a result of one volcanic eruption (AO1). The answer should include **accurate place-specific** detail. Amount of place-specific detail determines credit within the level. Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to why people experience varying impacts resulting from one volcanic eruption (AO2). **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the impacts people experience as a result of one volcanic	**6** **AO1 x3** **AO2 x3**	**Indicative content** Any volcanic eruption may be used in the answer and the choice of volcanic eruption will determine the content of the answer. **AO1 – 3 marks** Knowledge and understanding of the impacts people experience as a result of one volcanic eruption could potentially include: • Eyjafjallajokull eruption had impacts on Iceland, e.g. lava flow, flooding and ash fallout, and a number of other countries in 2010 e.g. travel disruptions, air freight disruptions (e.g. FedEx), goods spoilt (e.g. African flowers destined for European markets) • social impacts e.g. loss of life, disruption to working week, threats to homes • economic impacts e.g. the fine grained ash plume grounded flights across Europe, damage to agricultural land as ash fell • environmental impacts e.g. Eyjafjallajokull glacier

Question			Answer	Marks	Guidance
			eruption (AO1). The answer should include some **place-specific** detail which is **partially accurate**. Amount of place-specific detail determines credit within the level. Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to why people experience varying impacts resulting from one volcanic eruption (AO2). **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of the impacts people experience as a result of one volcanic eruption (AO1). There is an attempt to include **place-specific** detail but it is **inaccurate**. Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to why people experience varying impacts resulting from one volcanic eruption (AO2). **0 marks** No response or no response worthy of credit.		underneath the volcano, melted and caused widespread flooding, local water supplies were contaminated by the ash, 3,000 tonnes of carbon dioxide into the air per day. **AO2 – 3 marks** Application of knowledge and understanding to analyse why people experience varying impacts resulting from one volcanic eruption could potentially include: • release of fine dust particles and carbon dioxide e.g. 0.15 million tonnes each day and its effects on human health (e.g. breathing and lung capacity) • proximity to the volcanic eruption e.g. homes destroyed by the lava flows (which reached 3km from the volcanic fissure) and ash deposits • 150 metre thick ice cap melted which caused major flooding and 700 people were evacuated from their homes, with 20 farms destroyed • potential gains from volcanic activity e.g. numbers of visitors to Eyjafjallajokull significantly increased for the first couple of years after the event • the ash from the volcanic eruption was rich in nutrients and benefitted farmers however the eruption consisted mainly of glass which is not easily soluble in water e.g. silica and aluminium • ash falling in water courses (rivers) or travelling there via surface runoff can potentially harm and irritate the gills of fish and aquatic ecosystems which through the food chain could be passed onto humans.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td colspan="3"></td><td></td><td></td><td></td></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>Using the sulphur dioxide gas emissions data above, calculate the interquartile range. You must show your working.

Rank order
<table><tr><td>1</td><td>504</td></tr><tr><td>2</td><td>1131</td></tr><tr><td>3</td><td>1230</td></tr><tr><td>4</td><td>1380</td></tr><tr><td>5</td><td>1420</td></tr><tr><td>6</td><td>1570</td></tr><tr><td>7</td><td>1580</td></tr><tr><td>8</td><td>1660</td></tr><tr><td>9</td><td>2010</td></tr><tr><td>10</td><td>2219</td></tr><tr><td>11</td><td>2240</td></tr></table>
UQ – 2010 LQ – 1230
Workings 2010 - 1230
Interquartile range = 780</td><td>4
AO3 x4</td><td>AO3 – 4 marks
1 mark (✓) rank order of data
1 mark (✓) Upper quartile value identified
1 mark (✓) Lower quartile value identified
1 mark (✓) Interquartile range / answer

(Students do not necessarily need to use the formula, the 6th value is the mid point and the 3rd and 9th values can be identified as the LQ and UQ.)

 
</td></tr>
<tr><td></td><td>(c)</td><td>(ii)</td><td>Using evidence from the table, analyse the contrasts in sulphur dioxide emissions.

Level 3 (5-6 marks)
Demonstrates thorough application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to the contrasts in sulphur dioxide emissions (AO2).

Demonstrates thorough interpretation of the quantitative data resource to fully evidence the contrasts in sulphur dioxide emissions. There must be good ideas linking resource evidence to the possible causes of the contrasts in sulphur dioxide emissions (AO3).</td><td>6
AO2 x3
AO3 x3</td><td>Indicative Content
AO2 – 3 marks
Application of knowledge and understanding to analyse the contrasts in sulphur dioxide emissions could potentially include:
• sulphur is one of a number of gases released from volcanoes e.g. water vapour (most common about 60% emissions), carbon dioxide, chlorine, nitrogen, carbon monoxide and hydrogen
• sulphur dioxide emission rates will vary significantly according to the style of volcanic activity, type and volume of magma involved
• gases are released from magma below ground or as it rises, compositions of gases are dependent</td></tr>
</table>

Question			Answer	Marks	Guidance
			Level 2 (3-4 marks) Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to the contrasts in sulphur dioxide emissions (AO2). Demonstrates **reasonable** interpretation of the quantitative data resource to evidence the contrasts in sulphur dioxide emissions. There must be sound ideas linking resource evidence to the possible causes of the contrasts in sulphur dioxide emissions (AO3). **Level 1 (1-2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to the contrasts in sulphur dioxide emissions (AO2). Demonstrates **basic** interpretation of the quantitative data resource providing limited evidence of contrasts in sulphur dioxide emissions. There will be limited ideas about contrasts to sulphur dioxide emissions with limited or no link to resource evidence (AO3). **0 marks** No response or no response worthy of credit.		on the movement of magma in the volcano • as magma moves upwards, pressure decreases and it becomes more fluid, at this stage gases dissolved in the magma come out of solution and form bubbles, these expand to propel the magma to the surface • satellite instruments can detect sulphur dioxide as it absorbs strongly in ultra-violet wavelengths and has low background concentrations in the atmosphere, this makes it ideal for volcanic gas monitoring. **AO3 – 3 marks** Evidence from interpretation of the resource could potentially include: • 2010 is the year showing the lowest emissions which are approximately ¼ of the value for 2005, the year showing the highest emissions. • for 3 years, 2008, 2006, 2005 the emissions are over 2 000 metric tonnes/year. • 7 years have values which are roughly comparable, and range from 1131 (2009) to 1580 (2001) • the average emission for Kilauea volcano is 1,540, at least six years are above average.
	(d)		**'People have to live in tectonically active locations'. How far do you agree with this statement?** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of the reasons for living in tectonically active areas (AO1). Demonstrates **comprehensive** application of knowledge and	**12** **AO1 x6** **AO2 x6**	**Indicative Content** **AO1 – 6 marks** Knowledge and understanding of reasons why people live in tectonically active areas, could potentially include: • reasons why people choose to live in tectonically active locations, either areas prone to volcanic eruptions and / or earthquake activity • measures used to help people living in tectonically active areas (prone to volcanic eruptions and / or

Question			Answer	Marks	Guidance
			understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether people have to live in tectonically active locations (AO2). This will be shown by including **well-developed** ideas about whether people have to live in tectonically active locations. **Level 3 (7-9 marks)** Demonstrates **thorough** knowledge and understanding of the reasons why people live in tectonically active locations (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether people have to live in tectonically active locations (AO2). This will be shown by including **well-developed** ideas about whether people have to live in tectonically active areas. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of the reasons why people live in tectonically active areas (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether people have to live in tectonically active areas (AO2). This will be shown by including **developed** ideas about whether people have to live in tectonically active areas. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of the		earthquake activity) e.g. mitigation against vulnerability, the event and losses • changes in the frequency and impacts of tectonic hazards over time • the degree of risk posed by a hazard and the probability of the hazard event occurring • possible future strategies to cope with the risks from tectonic hazards. **AO2 – 6 marks** Application of knowledge and understanding to evaluate whether people have to live in tectonically active locations, could potentially include: • people have choices but these may be restricted by their economic wealth, low income populations may be less mobile • cost benefit analysis of moving, the economic and social benefits may outweigh the cost and risk perception e.g. San Francisco / California • balance of risk perception with frequency of hazard event. Populations may be highly resilient to a frequently occurring hazard such as an earthquake as it becomes 'the norm' e.g. Tokyo • resource or hazard debate – volcanic areas provide rich organic soils, minerals to mine and attractions for tourism, economic benefits outweigh the risk • advances in mitigation strategies such as prevention, prediction and preparation makes people feel less vulnerable e.g. Japan and the level of technological advancement with shock absorbing foundations, shatter proof glass, flexible cables for gas and electricity • there is now a greater awareness of tectonic hazards, the existence of early warning systems and the availability and readiness of emergency

Question			Answer	Marks	Guidance
			reasons why people live in tectonically active areas (AO1). Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether people have to live in tectonically active areas (AO2). This will be shown by including **simple** ideas about whether people have to live in tectonically active areas. **0 marks** No response or no response worthy of credit.		personnel, particularly in ACs • cultural significance (eruptions happen if the gods are unhappy), abundant food supplies and economic benefits living near volcano so populations wont / don't want to move. The benefits hugely outweigh the risks e.g. Philippines even though perceived as LIDC / EDC and poverty could be a key factor these areas are resource rich and so it's a misperception that people 'have' to live there • if populations have lived with the tectonic hazard risk e.g. volcanic eruption but it has not occurred in their lifetime or their parents / grandparents, the perception of risk may be lowered • greater warning signs with a volcano, build up to eruption (earthquake activity and gas emissions), evacuation is possible compared to an earthquake which is a rapid onset hazard so can't be predicted

Question			Answer	Marks	Guidance
6	(a)		**Using Fig.1, suggest how climate change influences geomorphic processes in landscape systems.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of climate change and geomorphic processes in landscape systems (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed interpretation that shows accuracy of how climate change influences geomorphic processes in landscape systems (AO2). This will be shown by including **well-developed** ideas linking resource evidence on climate change to geomorphic processes. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of climate change and geomorphic processes in landscape systems (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound interpretation that shows some accuracy of how climate change influences geomorphic processes (AO2). This will be shown by including **developed** ideas linking resource evidence on climate change to geomorphic processes.	**8** **AO1 x4** **AO2 x4**	**Indicative Content** **AO1 – 4 marks** Knowledge and understanding of climate change and geomorphic processes in landscape systems, could potentially include: • evidence the world has warmed since the late nineteenth century including increased atmospheric water vapour and atmospheric temperatures • geomorphic processes e.g. weathering, mass movement, erosion, transportation and deposition • specific weathering and erosion processes will depend on the landscape system e.g. coasts (marine erosion, aeolian deposition), glaciation (glacial erosion processes) or drylands (aeolian erosion). **AO2 – 4 marks** Application of knowledge and understanding to interpret how climate change influences geomorphic processes in landscape systems, could potentially include: • from Fig.1, higher amounts of precipitation particularly at the equator, alongside higher temperatures creating faster rates of erosion • evidence from Fig.1 shows significantly lower levels of precipitation between the equator and 40°N and S, coupled with rising global temperatures could exacerbate aeolian erosion processes • impact of increased temperature on weathering processes, in some areas mechanical weathering may decrease due to less severe frosts, chemical weathering generally increases with a rise in temperature • rising temperatures can lead to changes in glacial

			There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of climate change and geomorphic processes in landscape systems (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple interpretation that shows limited accuracy of how climate change influences geomorphic processes (AO2). There will be **simple** ideas linking resource evidence on climate change to geomorphic processes. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit		meltwater, which initially creates a larger volume of water for erosion and the drop in velocity can create areas of deposition • more precipitation means greater influence of chemical weathering processes on rocks from CO_2 dissolved in rainwater • global sea level changes will lead to increased wave energy and impact rates of coastal erosion • increase in temperatures leads to shrinking of ice sheets and glaciers leaving soil and rock surfaces exposed to weathering and erosion • global temperature rise, warm sea surfaces and increased evaporation giving rise to storm conditions especially in the tropics. As storms reach landfall they erode coastlines and deposit materials inland.
	(b)		**Examine how climate change impacts human use of landscape systems.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of climate change impacts and human use of landscape systems (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how climate change impacts human use of landscape systems (AO2). There must be **well-developed** ideas of how climate change impacts on human use of landscape systems.	**8** **AO1 x4** **AO2 x4**	**Indicative Content** **AO1 – 4 marks** Knowledge and understanding of climate change impacts and human use of landscape systems, could potentially include: • climate change with a particular focus on increases in surface, atmospheric and ocean temperatures • rising sea level • changes to ecosystems e.g. species extinction • extreme weather e.g. droughts and flooding • human use of landscape systems such as coastal management, water supply and economic development e.g. trade, tourism, resource extraction, dam construction.

			There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of climate change impacts and human use of landscape systems (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how climate change may impact on human use of landscape systems (AO2). There must be **developed** ideas of how climate change impacts on human use of landscape systems. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of climate change impacts and human uses of landscape systems (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how climate change may impact on human use of a physical landscape (AO2). This will be shown by including **simple** ideas of how climate change impacts on human use of landscape systems. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks**		**AO2 – 4 marks** Application of knowledge and understanding to analyse how climate change impacts human use of landscape systems, could potentially include: Coastal landscapes: • rising atmospheric and ocean temperatures leading to sea level rise provides challenges for coastal communities who need to mitigate the risk of flooding e.g. Bangladesh or Tuvalu. This is exacerbated by their currently low lying coastlines • ocean ecosystems can be damaged by changes in temperatures, rising sea levels, increased storm conditions and this impacts on food supplies e.g. fish as a natural resource • as climate change can increase coastal flooding, rates of erosion and deposition as well as alter flows of energy and materials along the coast, in turn influencing sediment cells. Glaciated landscapes: • thawing of permafrost through increasing global temperatures could lead to areas becoming increasingly accessible for resource extraction e.g. oil and natural gas • melting glaciers in places such as the Himalayas provide vital supplies of drinking water. With warming atmospheric temperatures, glaciers are shrinking and greater rates of evaporation could diminish these water supplies • in glaciated landscapes hydro-electric power provides power supplies however the changing climate is influencing precipitation and temperature patterns. With more unpredictable precipitation, seasons and lower levels of snow melt, water supplies for HEP are variable. Low levels of water could lead to deposition of material / sediments, making HEP a challenge.

			No response or no response worthy of credit.		Dryland landscapes: • water shortages from warming temperatures and drought conditions will lead to sediment deposition, silting up of rivers and preventing dams from operating and providing water supplies • a warmer climate or more volatile weather (greater wind speeds) could challenge economic activities linked with tourism such as dune buggying or camping, therefore protecting the landscape system from over use such as dune erosion • aeolian processes could occur at a more rapid rate with greater extremes of weather. As temperatures increase more places will be susceptible to these processes making them increasingly challenging for people to inhabit.

Question			Answer	Marks	Guidance
7	(a)		**Using Fig 2, suggest how responses to disease are influenced by landscape systems.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of responses to disease and landscape systems (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed interpretation that shows accuracy of how responses to disease are influenced by landscape systems (AO2). This will be shown by including **well-developed** ideas linking resource evidence on responses to disease outbreaks to landscape systems. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of responses to disease and landscape systems (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound interpretation that shows some accuracy of how responses to disease are influenced by landscape systems (AO2). This will be shown by including **developed** ideas linking resource evidence on responses to disease outbreaks to landscape systems. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant.	**8** **AO1 x4** **AO2 x4**	**Indicative Content** **AO1 – 4 marks** Knowledge and understanding of responses to disease and landscape systems, could potentially include: • physical barriers e.g. relief, natural hazards, excess water, remoteness of communities have positive and negative effects on mitigation strategies and response efforts in dealing with disease • direct and indirect strategies used by government and international agencies to mitigate against the disease and respond to outbreaks • role of international organisations e.g. World Health Organization in providing strategies to combat disease • role of an NGO in dealing with a disease outbreak • flows of energy and material through landscape systems • physical factors affecting landscape systems e.g. climate, wind, geology, relief • human activity and economic development in landscape systems e.g. power supplies (HEP). **AO2 – 4 marks** Application of knowledge and understanding to interpret how responses to disease are influenced by landscape systems could potentially include: • Fig. 2 shows an Ebola centre in a cleared area of a dense forest environment. Access would be challenging due to the remote nature of the treatment centre • the relief /terrain would influence the building of the Ebola treatment centre (in Fig. 2) and an understanding of the geology would be necessary for transport networks, building foundations and

			Level 1 (1-2 marks) Demonstrates **basic** knowledge and understanding of responses to disease and landscape systems (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple interpretation that shows limited accuracy of how responses to disease are influenced by landscape systems. (AO2). There will be **simple** ideas linking resource evidence on responses to disease outbreaks to landscape systems. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit		burying the deceased • immediate responses to a disease outbreak e.g. government and NGO providing clean water supplies could be challenged by accessibility within landscape systems and the role of climate • response to diseases longer term e.g. vaccination programs where the landscape system could provide supplies of energy e.g. HEP to power medical centres, especially in more remote locations • landscapes can be dynamic and therefore change this can present physical obstacles to medical supply routes • mobility of medical personnel to respond to diseases at a national and international scale may be influenced and restricted by difficult terrain and variable relief.
	(b)		**Examine how far the same physical factors affect disease outbreaks and landscape systems.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of how physical factors affect disease outbreaks and how physical factors affect landscape systems (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how the same physical factors affect disease outbreaks and landscape systems (AO2). There must be **well-developed** ideas about how physical factors affect disease outbreaks and landscape systems. There are clear attempts to make synoptic links between content from different parts of the course of study.	**8** **AO1 x4** **AO2 x4**	**Indicative Content** **AO1 – 4 marks** Knowledge and understanding of how the physical factors affect disease outbreaks and how physical factors affect landscape systems could potentially include: • global patterns of temperature, precipitation, relief and water sources and how they affect patterns of disease • physical factors influence vectors of disease such as mosquitoes • seasonal variations affect disease outbreaks such as drought or monsoons • climate change can provide the conditions for emerging infectious diseases • geographical area covered by a hazard and the influence of the risk and outbreak of disease • a range of physical factors influence landscape systems e.g. geology, climate (precipitation totals

			Level 2 (3-5 marks) Demonstrates **reasonable** knowledge and understanding of how physical factors affect disease outbreaks and how physical factors affect landscape systems (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how the same physical factors affect disease outbreaks and landscape systems (AO2). There must be **developed** ideas about how physical factors affect disease outbreaks and landscape systems. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of how physical factors affect disease outbreaks and how physical factors affect landscape systems (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how the same physical factors affect disease outbreaks and landscape systems (AO2). This will be shown by including **simple** ideas about how physical factors affect disease outbreaks and landscape systems. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		and patterns), latitude, altitude and relief • some physical factors affecting landscape systems are specific to the landscape chosen e.g. coasts – wind, waves, tides and global pattern of ocean currents. Glaciated – relief and aspect on microclimate and glacier movement. Drylands – availability of sediment. **AO2 – 4 marks** Application of knowledge and understanding to analyse how the same physical factors affect disease outbreaks and landscape systems could potentially include: • on a basic level it seems there are similar physical factors e.g. precipitation and relief affecting disease outbreaks and landscape systems however this is very much determined by the type of disease and the individual landscape system • physical factors themselves can vary significantly in terms of their rates, frequency, patterns and variability which will affect disease outbreaks and landscape systems alike e.g. higher rates of rainfall (monsoon conditions) can encourage a disease outbreak (cholera) and exaggerate processes in landscape systems e.g. rates of erosion • outbreaks of disease can vary in size from a small number of people infected in a restricted geographical area through to a country wide scale. A combination of physical factors can combine to influence the scale of the outbreak in the same way as they can affect landscape systems • some physical factors are particularly significant to disease outbreaks such as temperature and proximity to water sources. Whilst temperature is significant for landscape systems it can be linked to the rate of processes (erosion and weathering)

					which in turn affect landscape systems (and features created) whereas other physical factors such as precipitation have a direct effect on the landscape system • outbreaks of disease can also be determined by vectors e.g. mosquitoes, here a combination of warm and wet conditions encourage them to thrive and spread diseases e.g. malaria. The same physical factors can enhance processes in landscape systems e.g. soil erosion.

Question			Answer	Marks	Guidance
8	(a)		**Using Fig.3, suggest how clean ocean waters influence a sense of place identity.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of oceans waters and sense of place identity (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed interpretation that shows accuracy of how clean waters influence a sense of place identity (AO2). This will be shown by including **well-developed** ideas linking resource evidence on clean waters to a sense of place. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of oceans waters and sense of place identity (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound interpretation that shows some accuracy of how clean waters influence a sense of place identity (AO2). This will be shown by including **developed** ideas linking resource evidence on clean waters to a sense of place. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)**	**8** **AO1 x4** **AO2 x4**	**Indicative Content**. **AO1 – 4 marks** Knowledge and understanding of clean ocean waters and sense of place identity, could potentially include: • the global distribution of the world's oceans • variety of pollutants that affect ocean systems • how pollution can spread around the world via oceanic circulation • shaping place identity through demographic, socio-economic, cultural, political, built and natural characteristics • past and present connections that shape place identity • how people perceive places in different ways based on their identity e.g. age, gender, sexuality, religion and role. **AO2 – 4 marks** Application of knowledge and understanding to interpret how clean waters influence a sense of place identity could potentially include: • extent to which clean ocean waters create a sense of place identity, which can be positive or negative e.g. an environment in which people can feel a sense of connection whether it is through personal choices, their work, the geographical location or the natural area • the impact of clean ocean waters on a sense of place identity for different groups of people e.g. tourists, business owners, local residents • where clean ocean waters are challenged through pollution this could potentially impact peoples economic capacity and social standing, and therefore their sense of place identity. This may be a changing factor over time and so

			Demonstrates **basic** knowledge and understanding of oceans waters and sense of place identity (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple interpretation that shows limited accuracy of how clean waters influence a sense of place identity (AO2). There will be **simple** ideas linking resource evidence on responses to disease outbreaks to landscape systems. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit		communities with distinct cultural and demographic characteristics lose their sense of identity and the ocean environment begins to change e.g. small island communities • Fig. 3, demonstrates that for a number of places such as China, India, Brazil, Indonesia and Japan they are protecting their coastal areas and yet this does not easily correlate with them having waters which aren't as clean. These countries are across the development spectrum, it is not clear whether they are the ones causing the pollution or experiencing it through currents • evidence from Fig 3 shows that in general clean waters invoke a sense of place as they are a natural resource and they help shape the profile of a place as locals, tourists and businesses can enjoy them for leisure and economic pursuits, anomalies are Somalia and Canada.
	(b)		**Examine how living in an island community affects people's perception of place.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of life in an island community and people's perception of place (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how living in an island community affects people's perception of place (AO2). There must be **well-developed** ideas about how living in an island community affects people's perception of place. There are clear attempts to make synoptic links between content from different parts of the course of study.	**8** **AO1 x4** **AO2 x4**	**Indicative Content:** **AO1 – 4 marks** Knowledge and understanding of life in an island community and people's perception of place could potentially include: • threats to island communities • changing ways of life in island communities in response to food supplies, climate change, sea level rise, trade routes or geo-political relations • short term and long term adaptations by governments and communities • how people will perceive places in different ways according to their age, gender, religion and role • how level of emotional attachment to place can influence people's behaviour and activities in a place • how local communities shape the place they live **AO2 – 4 marks**

			Level 2 (3-5 marks) Demonstrates **reasonable** knowledge and understanding of life in an island community and people's perception of place (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how living in an island community affects people's perception of place (AO2). There must be **developed** ideas about how living in an island community affects people's perception of place. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of life in an island community and people's perception of place (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how living in an island community affects people's perception of place (AO2). This will be shown by including **simple** ideas about how living in an island community affects people's perception of place. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		Application of knowledge and understanding to analyse whether living in an island affects people's perception of place could potentially include: • whether an island community can affect people's perceptions of that place positively and negatively depending on their level of emotional attachment e.g. how long families have lived there, the types of jobs people have (if they commute off the island to work, people could be less emotionally attached) how involved people are in the community • unique geographical characteristics help shape the cultural traditions of the people e.g. Hawaii, this may influence people's perception of their place either as a resident or a visitor (tourist) e.g. festivals, aesthetic beauty, recreation and food supplies • influence of global connections (through flows of money, trade and the media) can drive changes in places and people's perceptions may be fluid and changing • threats to island communities e.g. sea level rise, overfishing, pollution, coastal erosion, decline of coral reefs can change ways of life and potentially erode people's perception of place as food supplies start to decline, once beautiful areas are less appealing for recreation due to pollution • ocean as a shared resource and source of isolation (geographical remoteness) and how islands build that sense of community and the players involved e.g. community groups (fishing, festivals, parents), local government through to groups of Pacific islands working together.

Question			Answer	Marks	Guidance
9	(a)		**Using Fig.4, suggest how the globalisation of the food industry influences place identity.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of the globalisation of the food industry and place identity (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed interpretation that shows accuracy of how globalisation of the food industry influences place identity (AO2). This will be shown by including **well-developed** ideas linking resource evidence on the globalisation of the food industry to place identity. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of the globalisation of the food industry and place identity (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound interpretation that shows some accuracy of how globalisation of the food industry influences place identity (AO2). This will be shown by including **developed** ideas linking resource evidence on globalisation of the food industry to place identity. There are some attempts to make synoptic links between content from different parts of the course of study but these are	**8** **AO1 x4** **AO2 x4**	**Indicative content.** **AO1 – 4 marks** Knowledge and understanding of the globalisation of the food industry and place identity could potentially include: • influence of globalisation on the food industry such as increased demand and global tastes • globalisation of the food industry involves greater interconnectedness, increased transnational flows of food, new transport routes and improved access to global food sources • globalisation of the food industry creates a number of opportunities including technological innovation and consumer choice • demographic, socio-economic, cultural, political, built and natural characteristics that shape a place identity • past and present connections that shape the place identity • how shifting flows of people, resources, money, investment and ideas shape the profile of places. **AO2 – 4 marks** Application of knowledge and understanding to interpret how globalisation of the food industry influences place identity could potentially include: • Fig. 4 shows, there is now a range of food sources available to the consumer and a variety of food types from different countries. These shifting flows of food resources create a sense of place identity by shaping the socio-economic and cultural profile • different cultural groups living abroad can access their preferred style of food and it may be from their country of origin, as Fig 4 demonstrates

			not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of the globalisation of the food industry and place identity (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple interpretation that shows limited accuracy of how globalisation of the food industry influences place identity (AO2). There will be **simple** ideas linking resource evidence on globalisation of the food industry to place identity. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		• improved access to global food sources has increased consumer's access to different foods and it is these present connections that shape the place identity e.g. multi-cultural area, Asian influence and community • migration helps shape the cultural profile of places. Food and retail outlets are part of the process that creates a clear place identity • the cultural mix of a place can be reflected in a very tangible way through the food outlets and allow residents to gain a cultural identity with their place • local communities can shape the place they live in and give a distinct identity through the introduction of 'native' food outlets relating to their culture.
	(b)		**Examine how food security can impact social inequality.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of food security and social inequality (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how food security can impact social inequality (AO2). There must be **well-developed** ideas about how social inequality can impact food security. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of	**8** **AO1 x4** **AO2 x4**	**Indicative content.** **AO1 – 4 marks** Knowledge and understanding of food security and social inequality could potentially include: • food security relates to the ability of all people at all times to have access to sufficient, safe and nutritious food. Food security varies within and between places • social, economic, political factors affecting food security e.g. landownership or land grabbing • human and physical factors have combined to cause issues with food security e.g. Zimbabwe with poor weather affecting harvests as well as government land reform and agricultural policies • regions, countries and people whose food security is most at risk across the development spectrum • concept of social inequality and how this is measured through indices such as housing,

			food security and social inequality (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how food security can impact social inequality (AO2). There must be **developed** ideas about how social inequality can impact food security. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of food security and social inequality (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how food security can impact social inequality (AO2). This will be shown by including **simple** ideas about how social inequality can impact food security. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		healthcare, education, employment and access to services • how and why spatial patterns of social inequalities vary both within and between places • how structural economic change impacts patterns of social opportunities and inequality for people and places. **AO2 – 4 marks** Application of knowledge and understanding to analyse how food security can impact social inequality could potentially include: • access and affordability of food is an issue across the development spectrum, whilst LIDCs traditionally have less access to food and a lack of money to buy food, this can be evident in ACs e.g. food banks, soup kitchens. Lack of access to food and it being unaffordable could be an indicator / indices of social inequality • education about what constitutes a healthy diet e.g. nutritional requirements for different groups of people for example children in remote rural areas in LIDCs • foods low in nutritional content and high in food enhancers, salt, and fat are often low cost and therefore the only affordable option to the lowest income groups. Whilst people might be seen to be more food secure the uneven distribution of this resource could create social inequality • organic and some health foods are often high cost and therefore unaffordable to disadvantaged sections of society • for more remote communities across the development spectrum, individuals can be food secure through their own gardens, livestock, access to natural resources and so they are creating opportunities through circumstance and

					so social inequality is potentially lower • a range of factors (that are often interrelated) can influence food security e.g. Darfur has to contend with harsh physical conditions within the Sahel as the region is environmentally fragile and drought prone alongside a civil war which has badly damaged infrastructure. This has created a region where food security is low with high levels of social inequality. The social inequality has been a result of lack of access to land, water and food supplies some of which is the natural environment as well as political instability.

Question			Answer	Marks	Guidance
10	(a)		**Using Fig.5, suggest how living in tectonically active areas influences place profiles.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of life in tectonically active areas and place profiles (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed interpretation that shows accuracy of how living in tectonically active areas influences place profiles (AO2). This will be shown by including **well-developed** ideas linking resource evidence on tectonically active areas to place profiles. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of life in tectonically active areas and place profiles (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound interpretation that shows some accuracy of how living in tectonically active areas influences place profiles (AO2). This will be shown by including **developed** ideas linking resource evidence on tectonically active areas to place profiles. There are some attempts to make synoptic links between content from different parts of the course of study but these	**8** **AO1 x4** **AO2 x4**	**Indicative content.** **AO1 – 4 marks** Knowledge and understanding of place profiles could potentially include: • reasons why people choose to live in tectonically active locations as a result of volcanic eruptions and / or earthquake activity • the impacts people experience as a result of volcanic eruptions and / or earthquake activity • economic, environmental impacts on a country as a result of volcanic eruptions and / or earthquake activity • demographic, socio-economic, cultural, political, built and natural characteristics that shape a place identity • past and present connections that shape the place identity • how shifting flows of people, resources, money, investment and ideas shape the profile of places. **AO2 – 4 marks** Application of knowledge and understanding to interpret how living in tectonically active areas influences place profiles, could potentially include: • Fig. 5, the cartoon shows a man's understanding of a hazardous environment which may not match reality depending on the past connections that have shaped the identity of Christchurch • the outrage on the man's face in the cartoon (fig.5) and his statement suggest the newspaper indicates the scale of the Christchurch earthquake to the reader e.g. death toll, and this in time could influence the place profile through economic impacts or outmigration due to the tectonic hazard

			are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of life in tectonically active areas and place profiles (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple interpretation that shows limited accuracy of how living in tectonically active areas can influence place profiles (AO2). This will be shown by including **developed** ideas linking resource evidence on tectonically active areas to place profiles. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit		• living in a tectonically active area may influence place profiles through the built and natural environments. The built environment could include hazard prevention measures e.g. shock absorbing foundations or shatter proof glass. The natural environment could be shaped by previous volcanic eruptions and so be aesthetically pleasing and fertile soils offer farming potential and therefore economic gains • living in a tectonically active area may influence place profiles through cultural characteristics. Culturally some communities offer sacrifices to volcanoes as they think Gods determine their eruptions. Some cities run earthquake drills due to the common occurrence of the hazard this may worry local people therefore encouraging them to move away creating shifting flows of people • tectonically active areas may have little influence on place profiles due to shifting flows of money and technology which allow for greater mitigation against the earthquake hazard. The resident population may become accustomed to the frequency of the tectonic activity and this becomes part of their day to day life.
	(b)		**Examine how volcanic eruptions can influence people's emotional attachment to a place.** **Level 3 (6-8 marks)** Demonstrates **thorough** knowledge and understanding of volcanic eruptions and people's emotional attachment to place (AO1). Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how volcanic eruptions can influence emotional attachment to place (AO2). There must be **well-developed** ideas about how volcanic	**8** **AO1 x4** **AO2 x4**	**Indicative content.** **AO1 – 4 marks** Knowledge and understanding of volcanic eruptions and people' emotional attachment to a place, could potentially include: • reasons why people choose to live in tectonically active locations as a result of volcanic eruptions • the impacts people experience as a result of volcanic eruptions • economic and environmental impacts on a country as a result of volcanic eruptions • the degree of risk posed by a hazard and the probability • how and why people perceive places in different

			eruptions influence emotional attachment to place. There are clear attempts to make synoptic links between content from different parts of the course of study. **Level 2 (3-5 marks)** Demonstrates **reasonable** knowledge and understanding of volcanic eruptions and people's emotional attachment to place (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how volcanic eruptions influence emotional attachment to place (AO2). There must be **developed** ideas about how volcanic eruptions influence emotional attachment to place. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-2 marks)** Demonstrates **basic** knowledge and understanding of volcanic eruptions and people's emotional attachment to place (AO1). Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how climate volcanic eruptions influence emotional attachment to place (AO2). This will be shown by including **simple** ideas about how volcanic eruptions influence emotional attachment to place. There are limited attempts to make synoptic links between content from different parts of the course of study.		ways based on their identity e.g. age, gender, sexuality, religion and role • how level of emotional attachment to place can influence people's behaviour and activities in a place. **AO2 – 4 marks** Application of knowledge and understanding to analyse how volcanic eruptions influence emotional attachment to place could potentially include: • the degree of risk posed by a volcano and how that is translated and conveyed between generations can impact on an individuals and communities perceptions and this will influence their level of emotional attachment e.g. remote communities attach a lot of cultural significance to living near a volcano, it is part of their community and identity • some communities believe a volcano is inhabited by a God / Gods e.g. In Bali locals sleep with their heads towards the volcano. Indonesian's offer sacrifices to the volcanoes such as goats, money and chickens to bring them prosperity. People's emotional attachment to the place has a significant impact on their behaviour and culture • volcanic eruptions have influenced people's activities in the area of Naples, Italy around Mount Vesuvius. Two large eruptions thousands of years ago left thick deposits of tephra which have weathered to form rich, fertile soils. This area is abundant for farming and there are a number of tourist related economic activities • Iceland utilises its tectonic and volcanic activity for economic gain through tourism and geothermal energy and it is very much a part of the countries identity. The geothermal energy and tourism (geysers, volcanoes, geothermal spas) are very much part of people's daily lives and their way of

			0 marks No response or no response worthy of credit.		supporting themselves, producing food (greenhouses) and a source of revenue (tours, hotels etc.) therefore their emotional attachment to their home / place • perception of volcanic eruptions depends on probability of it happening, the scale of the event and technological advancement to mitigate against the risk. Despite Montserrat last erupting in 1995, the inhabitants from the south of the island still no longer live there as they were evacuated off the island or to the north. Despite people's emotional attachment to their home, a strong fishing community and tourism industry the continued eruptions have made it too risky to return and there has been very little / no clean up. The perception of risk before 1995 was low as the previous eruption was 300 years ago and yet the long term effects have been devastating on individuals and the community of Montserrat • impact of volcanic eruptions may not be felt in someone's lifetime but they gain all benefits of living in a beautiful area due to the volcano, soils, farming, tourism potential. They could be emotionally attached to the place due to their family and personal circumstances and the volcanic eruption is not a particular reality to them.

Question			Answer	Marks	Guidance
11*			**'There is considerable doubt that the world has warmed steadily since the late nineteenth century.' How far do you agree with this statement?** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of evidence the world has warmed since the late nineteenth century. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of evidence the world has warmed since the late nineteenth century. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of evidence the world has warmed since the late nineteenth century. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the evidence the world has warmed since the late nineteenth century. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of the evidence of climate change.	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of evidence that the world has steadily warmed since the late nineteenth century could potentially include**:** • increase in surface, atmospheric and oceanic temperatures e.g. average surface warming of 0.89°C since late 19th century to 2012 • shrinking and thinning of valley glaciers and ice sheets e.g. Greenland and Antarctic ice sheets both shrinking; glaciers likewise in Alps, Andes, Himalayas and Rockies • rising sea levels e.g. globally,19cm since 1900 • increasing atmospheric water vapour e.g. increased precipitation being registered in mid-latitude Europe and parts of North America • decreasing extent and thickness of sea ice e.g. Arctic reducing by 4% per decade since 1970s; Antarctica by 1.5% per decade since 1970s • changes in nature (phenology) e.g. spring starting earlier, migration patterns of birds / insects changing • decreasing snow cover means the highly reflective nature of snow can no longer stop heat from the sun's energy being absorbed by the ground. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate whether there is considerable doubt the world has warmed steadily since the late nineteenth century could potentially include: • rates of change e.g. most of increase (warming)

Question			Answer	Marks	Guidance
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether the world has steadily warmed since the late nineteenth century. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of the evidence of climate change. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether the world has steadily warmed since the late nineteenth century. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of the evidence of climate change. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether the world has steadily warmed since the late nineteenth century. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of the evidence of climate change. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether the world has steadily warmed since the late nineteenth century.		since 1900 occurred in two distinct periods, 1910 – 1945 and since 1980; rate and direction of change not been constant e.g. relatively cool period during 1960s and 1970s • the evidence in the context of different named locations (examples) and comment on whether or not the evidence available allows a judgement to be made about the increase in global temperature e.g. early 20th century warming concentrated in North Atlantic; 1946 – 1975 there was significant cooling in North Atlantic and much of Northern Hemisphere; same period witnessed warming in much of Southern Hemisphere. Whilst some glaciers have been advancing other (90% of observed) glaciers are receding and or thinning • the role of the media and different interest groups in shaping the public image of climate change e.g. growing status of IPCC; influence of national reports e.g. Stern in UK; increasing public role taken up by bodies such as Met Office; role of diverse range of NGOs such as Christian Aid / Greenpeace and RSPB; role and status given to climate sceptics e.g. Nigel Lawson / lobby groups such as those sponsored by some energy companies • international political response to climate change (which began at the Earth Summit in Rio de Janeiro, 1995), this is now very much part of the UN global agenda e.g. COP21 (Paris 2015). The convention set out a framework for action aimed at stabilising atmospheric concentrations of greenhouse gases. The aim was also to create a legally binding and universal agreement on climate, with the aim of keeping global warming below 2 °C • how historical evidence can be less reliable and why current research e.g. pre-1950 far fewer

Question			Answer	Marks	Guidance
			0 marks No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		meteorological recording stations around the globe compared to a much denser network since; improved accuracy and reliability of instruments; new technologies to measure variables such as satellites; use of super-computers to improve data manipulation; upper air observations made systematically since 1940s; sub-surface oceanic temperatures made since 1940s; use of advanced radar and sonar to measure sea ice thickness; increasing number of glaciers now under regular and frequent observation.

Question			Answer	Marks	Guidance
12*			**Examine how successful international organisations have been in dealing with climate change.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of international organisations responses to climate change. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of international organisations responses to climate change. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of international organisations responses to climate change. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of international organisations responses to climate change. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of international organisations responses to climate change. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to how successful international organisations have been in dealing with climate	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of responses by international organisations to climate change could potentially include: • role of government and NGOs e.g. IPCC / UK Met Office / British Antarctic Survey / NOAA in research into the causes of climate change and in publicising their findings • trans-national government e.g. international conferences (e.g. Paris 2015; Copenhagen 2009; Bali 2007; Kyoto 1997) and their targets and agreements • trans-national and national government e.g. carbon trading e.g. EUETS (European Union Emission Trading Scheme) • the actions of non-governmental organisations such as pressure groups e.g. Friends of the Earth and NGOs e.g. WWF, in educating and promoting low-carbon living • an appreciation that responses can be at different scales (global, national and local initiatives) and at a governmental and non-governmental levels. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate how successful international organisations have been in dealing with climate change could potentially include: • the contested research and findings of groups such as IPCC / Met Office; the views of individuals and groups e.g. Profs Stott and Lomborg and a variety of think-tanks e.g. Nigel

Question			Answer	Marks	Guidance
			change. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of international organisations responses to climate change. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to how successful international organisations have been in dealing with climate change. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of international organisations responses to climate change. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to how successful international organisations have been in dealing with climate change. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of international organisations responses to climate change. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to how successful international organisations have been in dealing with climate change.		Lawson's Global Warming Policy Foundation • trans-national government e.g. international conferences – complex ways they can be set up e.g. Kyoto not ratified until 2005, five years after the conference; no 'teeth' regarding those countries failing to meet their targets; some countries not ratifying • attempts by international organisations to cut greenhouse gas emissions such as energy efficiency and conservation, fuel shifts, geoengineering, carbon capture e.g. promotion / subsidy of renewable energy such as solar and wind • issue of 'tragedy of the commons' appropriate here; atmosphere is a shared resource which is not 'owned' by any one country and pollution (CO_2) soon dispersed • successfulness of international organisations in outing climate change on the global agenda to ensure countries sign up to binding international agreements e.g. COP21 • pros and cons of carbon trading schemes e.g. European Union Emission Trading System (ETS). From 2005, 11,000 power stations and industrial plants in 30 countries (make up 50% of Europe's total) have their emissions capped. Companies can trade their allowances encouraging them to cut their emissions • fundamental issue of persuading general public to change their attitudes and behaviours e.g. shift from private to public transport • cost of national and international infrastructure schemes to reduce carbon production e.g. investment in transport; investment in renewable energies • challenges associated with effective mitigation,

Question			Answer	Marks	Guidance
			0 marks No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		have implications for successfulness e.g. renewable energies, new technologies, high-tech subway stations, protecting carbon sinks (forests and oceans) • International organisations need to be encouraging a coordinated approach at a range of scales to ensure the success of strategies to deal with climate change e.g. agreements over greenhouse gas emissions.

Question			Answer	Marks	Guidance
13*			**Examine the view that communicable diseases are dealt with more successfully than noncommunicable diseases.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of strategies to deal with communicable and noncommunicable diseases. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of strategies to deal with communicable and noncommunicable diseases. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of strategies to deal with communicable and noncommunicable diseases. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of strategies to deal with communicable and noncommunicable diseases. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of strategies to deal with communicable and noncommunicable diseases.	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of the strategies to deal with communicable and noncommunicable diseases could potentially include: • basic distinction between communicable (infectious or contagious) diseases and noncommunicable (non-infectious or non-contagious) diseases e.g. measles and dementia • modes of transmission of communicable diseases e.g. by air (measles); by blood (HIV/AIDS); by water (cholera); by human contact (herpes); by non-human organisms (malaria) e.g. vectors (mosquitoes) • noncommunicable by nature do not spread e.g. disease from ageing (cancers, dementia); lifestyle diseases (obesity); disease linked with environmental change e.g. pollution • direct and indirect strategies used by government and international agencies aimed at tackling communicable e.g. smallpox, typhoid, ebola and noncommunicable diseases e.g. cancers and dementia • role of international organisations e.g. World Health Organization and their strategies to combat diseases for both communicative and noncommunicative • role of an NGO in dealing with a disease outbreak at a national and local level e.g. HIV / AIDS or Ebola **AO2 – 10 marks**

Question			Answer	Marks	Guidance
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether communicable diseases are dealt with more successfully than noncommunicable diseases. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of strategies to deal with communicable and noncommunicable diseases. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether communicable diseases are dealt with more successfully than noncommunicable diseases. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of strategies to deal with communicable and noncommunicable diseases. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether communicable diseases are dealt with more successfully than noncommunicable diseases. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of strategies to deal with communicable and noncommunicable diseases.		Application of knowledge and understanding to analyse and evaluate whether communicable diseases are dealt with more successfully than noncommunicable diseases could potentially include: • wide range of causes of disease and this is very much dependant on the disease itself. The fact that some diseases can be passed on to humans via animals, vectors and other humans means these diseases have the potential to become more prevalent due to their rate of spread. Any strategies therefore need to combat the rate of spread and minimise the impacts • social factors affecting the spread of disease e.g. level of education in a country which influences quality and quantity of health care; level of education of individuals which influences their knowledge and understanding about disease and its spread including attitudes towards vaccination; attitudes and life styles such as death rites, sexual relationships, obesity; migration patterns • economic factors affecting the spread of disease e.g. financial resources of a country to provide health care; financial resources of individuals to provide their own health care such as access to health care, quality of housing, quality and quantity of diet; financial resources to afford supply of clean water and treatment of polluted water / sewage • political factors affecting the spread of disease e.g. approaches to spending on health care; attitudes towards vaccination / immunisation programmes such as compulsory or not; measures adopted when an outbreak occurs e.g. border controls; the impact of political

Question			Answer	Marks	Guidance
			Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether communicable diseases are dealt with more successfully than noncommunicable diseases. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		tension / war on the spread of disease • physical / environmental factors affecting the spread of disease e.g. climate; weather patterns such as monsoon; life cycles of vectors such as insects; obstacles to distributing health care such as remote mountain regions or dense tropical forest • for a communicable disease such as H1N1 swine 'flu or SARS the global scale of the outbreak compared to a local scale disease 'cluster' e.g. measles outbreak in South Wales 2012-3. The global scale of H1N1 and / or SARS has implications for how they are dealt with due to the number of national and international agencies involved, level of coordination, funding and at what time period the disease is 'caught' will affect rate of spread and containment • noncommunicable diseases can be mitigated over longer period with strategies escalating in scale of response e.g. national campaign (Stoptober and ACT F.A.S.T – strokes) versus an individual doctor. The success in dealing with these diseases can be down to people's lifestyle choices through diet, exercise, non-smoking, alcohol and sugar consumption.

Question			Answer	Marks	Guidance
14*			**Examine the extent to which technology can reduce the threats of disease.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of different ways to reduce threats from disease. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of different ways to reduce threats from disease. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of different ways to reduce threats from disease. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of different ways to reduce threats from disease. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how different ways to reduce threats from disease are aided by technology. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of the different ways to reduce threats from disease could potentially include**:** • prediction e.g. monitoring of population for early detection of disease e.g. screening programmes • prediction e.g. forecast likely strain of disease such as 'flu so that technology (vaccines) can be prepared • prevention e.g. immunisation programmes such as smallpox, polio and measles • prevention - technology used to distribute medicines e.g. refrigeration for some vaccines • prevention e.g. technology used to treat and distribute clean water and dispose sewage safely • treatment e.g. use of bio-technology such as scanners to give more precise internal image thereby aiding surgery, radio-therapy and machines carrying out advanced analysis of biopsy samples • treatment and prevention e.g. lasers, key-hole surgery, transplants, radio- and chemo-therapy • drug manufacturing (e.g. biotechnology) and global flows for distribution, top down strategies to deal with disease risk and eradication • medicines from nature and their medicinal importance for disease. **AO2 – 10 marks** Application of knowledge and understanding to

Question			Answer	Marks	Guidance
			technology can reduce threats from disease. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how different ways to reduce threats from disease are aided by technology. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to the extent to which technology can reduce threats from disease. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how different ways to reduce threats from disease are aided by technology. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which technology can reduce threats from disease. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how different ways to reduce threats from disease are aided by technology. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which technology can reduce threats from disease.		analyse and evaluate the extent to which technology can reduce the threats of disease could potentially include: • reducing the threats of disease requires prediction technologies, global monitoring to ensure effective mitigation strategies at international and national scales e.g. GIS, disease prediction models, biotech research, national data gathering (UK breast cancer study of 100,000 women) • a clear divide exists across the development continuum regarding ability of countries to provide technology to combat disease; medical technology often requires much capital and human resourcing • differential provision of technology (vaccination programs) within a country e.g. urban – rural contrasts as well as regional differences such as core-periphery • some disease threats are proving difficult to combat e.g. some cancers, Alzheimer's, sleeping sickness, dengue fever • the emergence of resistant bacteria due to the over-use of technology in the form of antibiotics e.g. anti-malarial resistant mosquitoes • political factors influencing the use of technology e.g. HIV/AIDs drug manufacturers owned by ACs charging high prices and patenting of drugs affecting access by LIDCs to these products • social factors acting against technology such as attitudes towards sexual relations and intra-venous drug use for example in the spread of HIV/AIDs; attitudes towards life-style causes of disease e.g. tobacco and alcohol and certain

Question			Answer	Marks	Guidance
			0 marks No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		types of food / diet linked to obesity • sliding scale of technology, for isolated communities solar panels on a medical centre to refrigerate medicines reduces the threat or the WHO / UN providing mosquito nets as part of the Millennium Development Goals through to patenting of drugs e.g. global drug manufacturing (GlaxoSmithKline) • technology to reduce the disease threat can be relative e.g. medicinal plants from nature can be used to combat diseases and / or the symptoms of and for some communities refining their use (e.g. cooking, drying etc.) could be a low tech solution.

Question			Answer	Marks	Guidance
15*			**Examine the extent to which oceanic waters are being altered by human activity.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of the human activities altering oceanic waters. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of the human activities altering oceanic waters. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the human activities altering oceanic waters. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the human activities altering oceanic waters. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how human activities alter oceanic waters. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based of the extent to which human activities alter oceanic waters.	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of how human activities are altering oceanic waters, could potentially include**:** • rising temperatures of ocean waters due to enhanced greenhouse effect caused by human activities and the effects on marine environments e.g. coral bleaching • rising sea level due to thermal expansion of water (primary reason) and transfer of land-ice / snow to oceans • changes in ocean currents e.g. North Atlantic circulation due to increased flows of fresh water from ice / snow melt due to global warming • extent and thickness of sea ice both in Arctic and around the Antarctic e.g. ice shelves • use and management of ocean biological resources, energy resources and sea bed minerals • major sources of pollutants e.g. fossil fuels, domestic and industrial waste (plastics, nuclear waste, oil spill) and the impact on marine ecosystems • acidification of ocean waters due to absorption of CO_2 from the atmosphere • human activities on land can lead to alterations in oceanic water e.g. deforestation leads to increases in sediment levels in rivers. These transport sediment into coastal oceanic waters increasing turbidity which can effect ecosystems such as corals e.g. Great Barrier Reef **AO2 – 10 marks** Application of knowledge and understanding to

Question			Answer	Marks	Guidance
			Level 3 (5–7 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how human activities alter oceanic waters. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence of the extent to which extent to which human activities alter oceanic waters. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how human activities alter oceanic waters. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence of the extent to which human activities alter oceanic waters. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy how which human activities alter oceanic waters. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions of the extent to which human activities alter oceanic waters. **0 marks** No response or no response worthy of credit.		analyse and evaluate the extent to which oceanic waters are being altered by human activity could potentially include: • the extent to which anthropogenic climate change has affected the nature of the ocean's water in terms of acidity, the current rate of acidification has not been seen in the last 400,000 years. Ocean science is relatively new, meaning that knowledge and understanding of oceanic processes requires much more research • rising oceanic water temperatures linked to global warming and atmospheric CO_2 levels, current rate of increase in CO_2 exceeds rates recorded in past 800,000 years (Antarctic ice cores) • reductions in annual average Arctic sea ice accelerating, satellite and submarine data now conclusive • melting of Antarctic ice less clear; some small ice shelves have collapsed e.g. Larsen A in 1995 although others not so affected e.g. Wilkins • some rivers naturally high in suspended sediments which means that coastal oceanic waters close to their mouths have relatively high sediment content. However, human activity (e.g. deforestation and sea-bed mining) known to add high volumes of sediment into oceanic waters • Deep Water Horizon oil well explosion (2010), the oil spill was approximately 3.2 million barrels over 87 days, with a huge environmental impact. The marshlands of the Gulf coast were covered in oil, the fishing industry saw large impacts on fish stocks (shrimp) as well as the impact on birds, turtles and dolphins in the marine ecosystem • biological resource extraction (fishing), with advances in fishing equipment, larger ships with tracking technologies mean fish stocks are now being significantly reduced. Fishing techniques

Question			Answer	Marks	Guidance
			Quality of extended response **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		such as dredging and trawling cause impacts to marine habitats and organisms on the sea bed • extent of oceanic waters being altered depends on the ability of oceans to absorb, filter and distribute a variety of waste products. A number of international and national strategies have been put in place to protect the ocean e.g. fishing quotas, marine pollution conventions, UN World Ocean Assessment.

Question			Answer	Marks	Guidance
16*			**Assess the effectiveness of stakeholders in the management of one oceanic resource.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of how stakeholders manage an oceanic resource. **Level 3 (5-7 marks)** Demonstrates **thorough** knowledge and understanding of how stakeholders manage an oceanic resource. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of how stakeholders manage an oceanic resource. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of how stakeholders manage an oceanic resource. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how stakeholders manage an oceanic resource. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the effectiveness of various stakeholders in the management of an oceanic resource.	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of one oceanic resource and the stakeholders involved in its management could potentially include**:** • use and management of renewable biological resources e.g. fish, whales and krill • use and management of ocean energy resources e.g. oil, gas, wave and tidal • use and management of sea-bed minerals as non-renewable resources e.g. ferrous (iron ore and manganese) and non-ferrous (gold and copper) • management strategies for ocean resources e.g. quotas, whaling rights, international treaties, marine conservation areas, access to areas of the sea and international laws • there will be a variety of stakeholders involved in the management of ocean resources at a range of scales e.g. small island communities, national governments – territorial waters, Exclusive Economic Zones, trans-national governments e.g. EU - Common Fisheries Policy and international agencies such as the United Nations e.g. UNCLOS agreement. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate the effectiveness of stakeholders in the management of one oceanic resource could potentially include: • the relative importance of the approach of a range of stakeholders e.g. whaling is a very contested resource with differing positions being strongly defended by various nations e.g. Japan and Norway compared to Australia

Question			Answer	Marks	Guidance
			Level 3 (5–7 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how stakeholders manage an oceanic resource. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to the effectiveness of various stakeholders in the management of an oceanic resource. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how stakeholders manage an oceanic resource. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the effectiveness of various stakeholders in the management of an oceanic resource. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how stakeholders manage an oceanic resource. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the effectiveness of various stakeholders in the management of an oceanic resource. **0 marks** No response or no response worthy of credit.		• the effectiveness of the various stakeholders in the management of an oceanic resource e.g. EU and fisheries; International Whaling Commission and whale catches for 'scientific' purposes; managing activities though treaties and laws ('high seas') also the idea of the 'tragedy of the commons' where resources are depleted • whether collaborative approaches from stakeholders have been more effective e.g. EU Common Fisheries Policy or the Antarctic Treaty • how the values, attitudes, socio-economic status and political context of the stakeholders influence the use and management of the resource e.g. the cultural importance of whales in Japan and amongst various Inuit peoples; political influence of governments on off-shore oil and gas exploitation e.g. US, Norway and UK • the resilience of the resource and key thresholds to initiate management e.g. resources such as fish and whales are potentially renewable whereas minerals and energy resources are non-renewable and finite in nature • different species of fish / whales have different thresholds for effective management and possess varying levels of resilience e.g. recovery of cod stocks in North Sea. However, accurate and reliable data e.g. stock levels can be difficult to obtain.

Question			Answer	Marks	Guidance
			Quality of extended response **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Marks	Guidance
17*			**Examine the extent to which food security can impact on people's lives.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of the ways food security can impact on people's lives. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of the ways food security can impact on people's lives. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the ways food security can impact on people's lives. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the ways food security can impact on people's lives. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how food security impacts on people's lives. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based of the extent to which food security can impact on people's lives.	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of food security and impacts on people's lives could potentially include: • food security issues e.g. food shortages and surpluses (obesity) can have health issues associated • high levels of food security mean people are able to fight off disease e.g. rickets more readily and vice versa • high levels of food security mean that both mother and baby are more healthy before, during and after birth, this is very significant in reducing maternal and infant mortality • food security can be increased through the use of chemicals and pesticides to grow certain crops, these can have harmful effects on human health • high levels of food security are usually associated with secure economic status and a pre-requisite for an effective health care system e.g. Singapore, Australia or Austria. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate the extent to which food security can impact people's lives could potentially include: • in general, the greater the level of food security, the more healthy people are, e.g. ACs and most EDCs are food secure and have high levels of health e.g. Europe and most of Latin America, whereas LIDCs tend be food insecure and have lower levels of health e.g. sub-Saharan Africa • a very high level of food security can lead to

Question			Answer	Marks	Guidance
			Level 3 (5–7 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how food security impacts on people's lives. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence of the extent to which food security can impact on people's lives. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how food security impacts on people's lives. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence of the extent to which food security can impact on people's lives. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how food security impacts on people's lives. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions of the extent to which food security can impact on people's lives. **0 marks** No response or no response worthy of credit.		some people within a country over-consuming food, having an ill-balanced diet both in terms of quantity and quality. This can lead to health issues associated with obesity such as diabetes, cardio-vascular diseases, some cancers and long term impacts on joints such as hips and knees e.g. USA and UK • within a country, food security can vary significantly amongst the population so an average assessment of food security may hide groups who are food insecure and whose health suffers as a consequence e.g. the poor in any country are likely to be the least food secure and the most unhealthy. This point applies to ACs, EDCs and LIDCs. In ACs people can still be malnourished and have to access food through food banks, soup kitchens • high levels of food security can involve intensive agriculture which uses pesticides, insecticides and herbicides which can have detrimental effects on people's health • population increase and pressure on food supplies in areas that are environmentally fragile e.g. The Sahel, small changes in population can significantly affect food supplies and therefore the survival of populations • food prices are changeable according to demand, supply and consumer tastes so the knock on effect on the state of food security in individual areas, countries or regions could change e.g. pest outbreak, adverse weather, changing prices (seeds, fertilisers etc). People can become food insecure quite quickly • indigenous group's are resilient in terms of their survival and food security e.g. in tropical rainforest areas, sustainable use of the forest by shifting cultivators so they are food secure.

Question			Answer	Marks	Guidance
			Quality of extended response **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		However, challenges to their food security are created by declining soil fertility, soil erosion and flooding • large scale commercial agriculture in tropical rainforest areas can be unsustainable creating lasting impacts on the environment and its ability to be able to support resident populations. Rates of deforestation affect the biodiversity of the forest, creates soil erosion and land degradation as soils are overgrazed and planted.

Question			Answer	Marks	Guidance
18*			**'Globalisation of the food industry creates more opportunities than issues.' How far do you agree with this statement.** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of opportunities and issues created by globalisation of the food industry. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of opportunities and issues created by globalisation of the food industry. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of opportunities and issues created by globalisation of the food industry. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of opportunities and issues created by globalisation of the food industry. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate as to how globalisation of the food industry creates opportunities and issues. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of opportunities and issues created by globalisation of the food industry could potentially include: • influence of globalisation on the food industry e.g. increased demand (e.g. meat) and global tastes (e.g. western foods in China) • the roles of TNCs and agribusinesses involved in food production e.g. Unilever and Monsanto • the roles of TNCs and other businesses involved in food processing, transport, distribution and retailing e.g. Nestlé, Unilever and Walmart • the roles of governments and organisations e.g. trans-national (EU / UN / FAO / WTO), national e.g. UK, on agricultural policies and other policies impacting on food production e.g. environmental programmes. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate whether the globalisation of the food industry creates more opportunities than issues could potentially include: • the role of key players who influence production within the global food system and the extent to which they bring about change e.g. the use of GM crops; the loss of family farms to agribusinesses • the role of food processors, distributors and retailers on the global food system e.g. the role of TNC retailers e.g. Walmart in determining what farmers grow, where and when • the role of players/stakeholders e.g. FAO and WTO on the global food system e.g. the generally positive view of the FAO in improving food security and achieving rural development

Question			Answer	Marks	Guidance
			evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether the globalisation of the food industry creates more opportunities than issues. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to how globalisation of the food industry creates opportunities and issues. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether the globalisation of the food industry creates more opportunities than issues. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy as to how globalisation of the food industry creates opportunities and issues. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether the globalisation of the food industry creates more opportunities than issues. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy as to how globalisation of the food industry creates opportunities and issues. Demonstrates **basic** application of knowledge and		compared to the WTO which to some serves the best interests of ACs more than others such as the LIDCs • the role of changing consumer tastes as a result of globalisation on the global food system e.g. increased demand for 'exotic' and staple foods all year round in ACs such as strawberries, avocados and runner beans • the effect of rising demand for meat in EDCs and LIDCs as living standards for some of their populations rise and the 'westernisation' of diets through globalisation processes e.g. East and South East Asia • the extent to which climate change is causing change to the global food system e.g. the availability of water, hotter temperatures or the spread of certain pests. Agricultural produce could be genetically modified to cope with these changes • food miles have increased due to the globalisation of food as it moves from farm to plate. Food largely travelling by air and HGVs with increasing levels of air pollution, high environmental impacts • globalisation of the fast food industry links with Americanisation and what they represent in terms of western culture e.g. Coca Cola and McDonalds. This desire in some countries / cultures is leading to growing amounts of obesity • technological innovations in farming e.g. digital soil mapping in data sparse regions such as Africa, hydroponics using mineral-enriched water, electronics giants using indoor vegetable farms such as Sharp, growing strawberries in Dubai or Sony growing lettuce and radishes in Japan.

Question			Answer	Marks	Guidance
			understanding to provide an un-supported evaluation that offers simple conclusions as to whether the globalisation of the food industry creates more opportunities than issues. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Marks	Guidance
19*			**'Environmental impacts of tectonic hazards are more significant than economic impacts.' How far do you agree with this statement?** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of the environmental and economic impacts of tectonic hazards. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of the environmental and economic impacts of tectonic hazards. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the environmental and economic impacts of tectonic hazards. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the environmental and economic impacts of tectonic hazards. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate as to whether environmental impacts of tectonic hazards are more significant than economic impacts. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of the environmental and economic impacts of tectonic hazards could potentially include: • probability of the tectonic hazard event occurring again contrasting types of tectonic hazards (disaster risk equation is appropriate here) • the relationship between the frequency and type of tectonic hazard and their environmental impacts e.g. the impacts of earthquakes at a destructive zone compared to a constructive zone; contrasts in types of volcanic eruptions • environmental impacts of tectonic hazards (dependant on case studies and hazards chosen) e.g. pyroclastic flows, lahars, landslides, flooding, soil liquefaction, ecosystem / habitat destruction • economic impacts of tectonic hazards (dependant on case studies and hazards chosen) e.g. destruction of homes, businesses, transport and infrastructure networks, planning for prediction, mitigation and modifying • levels of economic impact can be relative to levels of development, technological advancement in prediction and prevention methods e.g. contrast between ACs (Japan) and EDCs and LIDCs (Indonesia / Nepal) • numbers of people affected due to increasing population or reduction in people affected due to progress in monitoring, prediction, prevention and planning e.g. contrast between earthquakes and volcanic eruptions. **AO2 – 10 marks**

Question			Answer	Marks	Guidance
			conclusions that are evidence based as to whether environmental impacts of tectonic hazards are more significant than economic impacts. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy as to whether environmental impacts of tectonic hazards are more significant than economic impacts. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether environmental impacts of tectonic hazards are more significant than economic impacts. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of as to whether environmental impacts of tectonic hazards are more significant than economic impacts. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether environmental impacts of tectonic hazards are more significant than economic impacts. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of as to whether environmental impacts of tectonic hazards are more significant than economic impacts. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that		Application of knowledge and understanding to analyse and evaluate whether the environmental impacts of tectonic hazards are more significant than economic impacts could potentially include: • extent to which tectonic hazards have caused greater environmental impacts than economic impacts. The contrast between a high energy event in a remote location compared to a similar event in a densely populated region e.g. Ghorka compared to Kathmandu in Nepal (April 2015) • types of tectonic hazard and their impacts, earthquakes are more challenging to predict and a sudden onset hazard, however, volcanoes show a build-up of activity through gas emissions, rising heat and seismic activity (earthquakes). Mitigation strategies for earthquakes in some ACs (e.g. Japan) can significantly reduce the impacts however this is more challenging for volcanoes as the nature of eruptions (size, speed, direction, primary and secondary impacts) varies • development of areas in hazard prone regions has caused impacts to vary e.g. contrasts between ACs such as Japan and EDCs and LIDCs such as Indonesia and Nepal in terms of monetary impacts • it is challenging to evaluate the environmental and economic impacts of tectonic hazards due to their scale, intensity, duration, resilience, who and what is affected • the ability of places (at a range of scales and across the development spectrum) to respond and recover from tectonic events could be useful in evaluating the impacts. This could be more pertinent to economic impacts • impacts can be positive as well as short and long term e.g. ash fall from volcanic eruptions

Question			Answer	Marks	Guidance
			offers simple conclusions as to whether environmental impacts of tectonic hazards are more significant than economic impacts. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		provides minerals for agriculture. Some lava flows take time to weather, in the long term minerals and nutrients will be released. Volcanic eruptions can generate tourist revenues e.g. Mt Etna in Sicily, tours, helicopter flights, school groups and scientific study.

Question			Answer	Marks	Guidance
20*			**'Managing hazards in Advanced Countries (ACs) is more successful than any other area of the world.' How far do you agree with this statement?** **AO1** **Level 4 (8-10 marks)** Demonstrates **comprehensive** knowledge and understanding of the management of tectonic hazards. **Level 3 (5–7 marks)** Demonstrates **thorough** knowledge and understanding of the management of tectonic hazards. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the management of tectonic hazards. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the management of tectonic hazards. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (8–10 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of the differences in managing hazards in Advanced Countries (ACs) compared to the rest of the world. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether managing hazards in Advanced Countries (ACs) is an easier task than	**20** **AO1 x10** **AO2 x10**	**Indicative content** **AO1 – 10 marks** Knowledge and understanding of how tectonic hazards are managed could potentially include: • attempts and abilities to mitigate against the event e.g. land use zoning, education, emergency planning and rescue • attempts and abilities to manage vulnerability and exposure e.g. prediction and warning • the relationship between disaster and response in the context of contrasting economic contexts e.g. rescue and emergency relief, longer term aid, insurance e.g. contrast between Japan, Chile, China and Nepal • attempts to mitigate against losses e.g. insurance, rescue and emergency relief • degree of risk posed by a hazard and the probability of the hazard event occurring. **AO2 – 10 marks** Application of knowledge and understanding to analyse and evaluate whether ACs can manage hazards more successfully than any other area of the world could potentially include: • links between economic development and technological development. Technology can play a very significant role in monitoring and prediction; in mitigation strategies; and in recovery e.g. contrast between Japan and Nepal • links between economic development and degree of vulnerability and exposure of communities • types of tectonic hazard and their impacts, earthquakes are more challenging to predict and a sudden onset hazard, however,

Question			Answer	Marks	Guidance
			managing hazards in the rest of the world. **Level 3 (5–7 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of the differences in managing hazards in Advanced Countries (ACs) compared to the rest of the world. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence as to whether managing hazards in advanced countries is an easier task than managing hazards in the rest of the world. **Level 2 (3–4 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of the differences in managing hazards in Advanced Countries (ACs) compared to the rest of the world. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether managing hazards in advanced countries is an easier task than managing hazards in the rest of the world. **Level 1 (1–2 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of the differences in managing hazards in Advanced Countries (ACs) compared to the rest of the world. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that		volcanoes show a build-up of activity through gas emissions, rising heat and seismic activity (earthquakes). Mitigation strategies for earthquakes in some ACs (e.g. Japan) can significantly reduce the impacts however this is more challenging for volcanoes as the nature of eruptions (size, speed, direction, primary and secondary impacts) varies • links between scale (magnitude) of an earthquake and the ability of a society to manage it e.g. any AC will struggle to manage a very high energy earthquake e.g. Japan 2011 • links between factors such as population density, building design and stability, infrastructure (gas and electricity pipes) and transport networks and the ability to manage earthquake hazards irrespective of economic status / level of development • that significant management can be achieved by EDCs and LIDCs e.g. Nepal in basic housing design, education and preparedness of population as well as the emergency services • understanding of hazards for management to be effective. Looking at what it means to be successful. ACs potentially have access to a greater range of monitoring equipment, prediction technologies / models to reduce vulnerability of populations however international support, experts and technologies are available to countries across the development spectrum e.g. Montserrat, consultants working with local government looking at resettling populations in the South West of the Island and the clean-up operation.

Question			Answer	Marks	Guidance
			offers simple conclusions as to whether managing hazards in advanced countries is an easier task than managing hazards in the rest of the world. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Assessment Objectives (AO) grid

Candidates answer either question 1, 2, 3, 4 or 5, either question 6, 7, 8, 9 or 10 and one of questions 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20.

Question	AO1	AO2	AO3	Marks
1, 2, 3, 4 or 5 (a)(i)	4			4
1, 2, 3, 4 or 5 (b)	3	3		6
1, 2, 3, 4 or 5 (c)(i)			4	4
1, 2, 3, 4 or 5 (c)(ii)		3	3	6
1, 2, 3, 4 or 5 (d)	6	6		12
6, 7, 8, 9 or 10 (a)	4	4		8
6, 7, 8, 9 or 10 (b)	4	4		8
11, 12, 13, 14, 15, 16, 17, 18, 19 or 20	10	10		20
Total	31	30	7	68